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PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

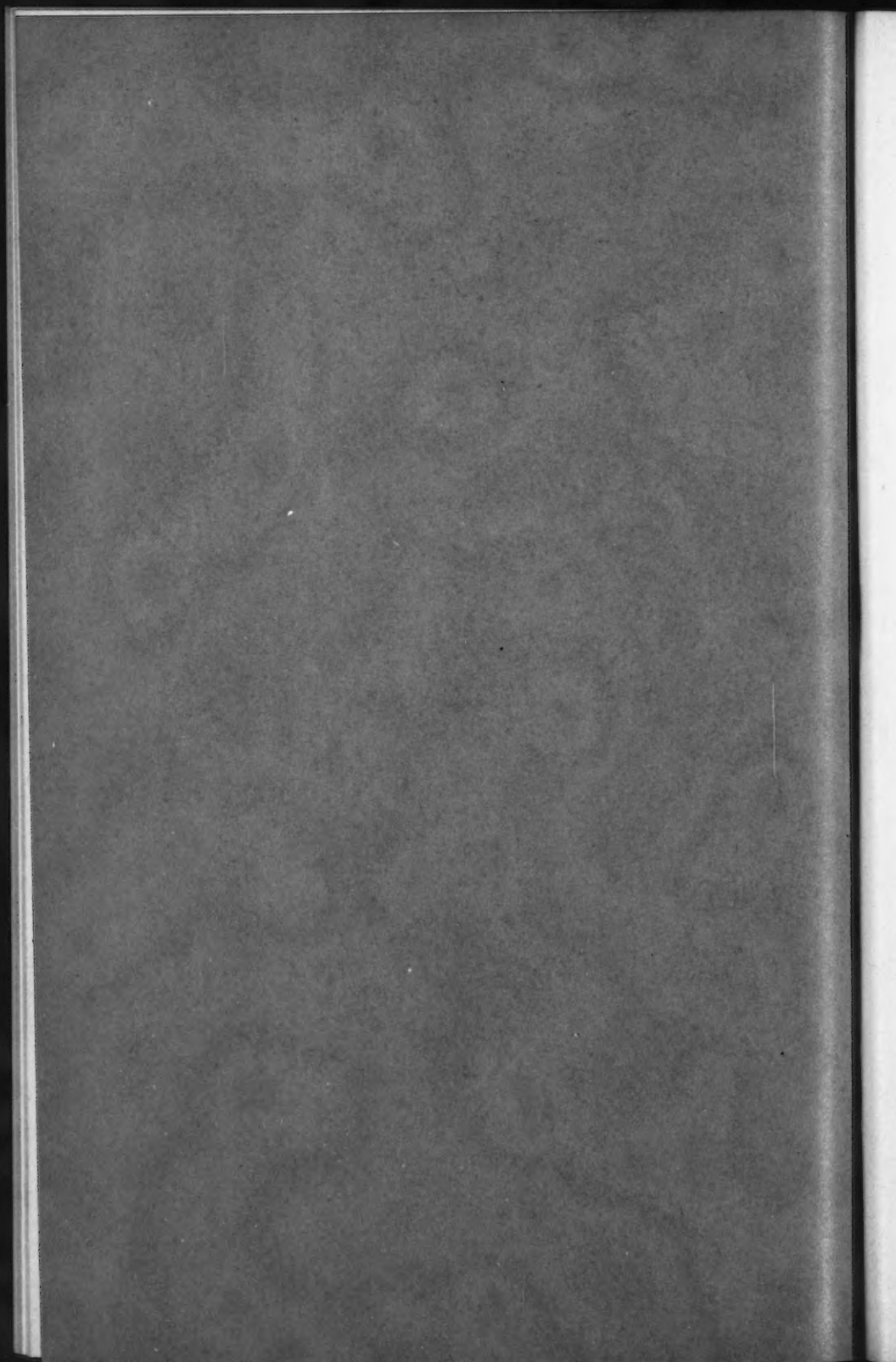
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AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS*

This Society is not responsible for any statement made or opinion expressed
in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS
OF THE SOCIETY

April 21st, 1920.—The meeting was called to order at 8.30 P. M.; Director J. S. Langthorn in the chair; J. P. J. Williams, Assoc. M. Am. Soc. C. E., acting as Secretary; and present, also, 107 members and guests.

A paper entitled "Notes on Tunnel Lining", by S. Johannesson and B. H. M. Hewett, Members, Am. Soc. C. E., was presented by Mr. Hewett, and the subject was discussed by Messrs. J. C. Meem, F. A. Snyder, W. C. Parmley, C. M. Holland, T. Kennard Thomson, E. G. Haines, O. L. Brodie, and Robert Ridgway, Messrs. Meem and Parmley illustrating their remarks with lantern slides.

Mr. Williams presented the report, to the Board of Direction, of the Tellers appointed to canvass the ballot on the Questionnaire on the Report of the Committee on Development, as follows:

* This issue of *Proceedings* is late in delivery owing to the serious paper situation and delay in obtaining a sufficient quantity from the mill.

"NEW YORK, N. Y., APRIL 14TH, 1920.

"TO THE BOARD OF DIRECTION:

"Your Committee delegated to canvass the ballots cast upon the Questionnaire on Report of the Development Committee presents its report herewith:

"Total number of ballots received.....	4 026
"Ballots without signature.....	12
Letters and telegram asking Secretary to cast ballot	3
Ballots from members in arrears of dues.....	50
Ballots from those not entitled to vote.....	5
Sub-total	70
Ballots with lettered instead of written signatures	43
Total number of ballots excluded.....	113
"Ballots canvassed.....	3 913

"For the information of the Board, the Committee reports that the 43 'Ballots with lettered instead of written signatures', which were excluded from the canvass of ballots, were as follows:

Question.	Yes.	No.
A-1	30	14
A-2	30	13
A-3	18	23
B-1	36	5
B-2	33	8
B-3	36	6
B-4	30	10
B-5	30	13
B-6	25	16
B-7	11	30

"A copy of the form of ballot is attached hereto.*

"Respectfully submitted,

"OTIS E. HOVEY, *Chairman,*

C. C. ELWELL,

LEONARD METCALF,

"Canvassing Committee of the Committee on Questionnaire on the Report of the Development Committee."

"Tellers:

"J. LOEWENSTEIN,
C. K. CONARD,
GEORGE PERRINE,
EDWARD ANDERBERG,
ROBERT RIDGWAY,
F. S. CROWELL,
LEICESTER DURHAM,

JAMES F. SANBORN,
BORDEN B. HARRIS,
J. P. J. WILLIAMS,
A. R. AROHER,
S. N. CASTLE,
JOHN P. HOGAN,
NORMAN COLLYER."

* The Questionnaire and a tabular statement of the results by geographical districts will be found on p. 476.

The election of the following candidates on April 19th, 1920, was announced:

As MEMBERS

THEODORE HORATIO ELLIS, Summit, N. J.
ALBERT WALTER LEE, Des Moines, Iowa
HARRY CHICKALL LOTT, Baghdad, Mesopotamian Expeditionary
Forces
JOHN PATRICK MYRON, Oil City, Pa.
AUGUSTUS ROGERS, Washington, D. C.
LEWIS KETCHAM SILLCOX, Milwaukee, Wis.
CHARLES DABNEY SNEAD, Frankfort, Ky.
FRED RAY WHITE, Ames, Iowa

As ASSOCIATE MEMBERS

JAMES PROCTOR ALLARDICE, Fall River, Mass.
ROBERT ADAMS ALLTON, Chicago, Ill.
WILLIAM MILNES AUSTIN, Waynesboro, Va.
LEROY WRIGHT BARBOUR, Cushing, Okla.
JOHN GORDON BARRY, Wheeling, W. Va.
CHARLES WALTER BECKER, Amsterdam, N. Y.
WALTER EDWARD BLOMGREN, Deaver, Wyo.
FRANK SIMMONS BOOTHE, Groveland, Cal.
JOSEPH OAKLEY BROWN, New York City
WALTER CLINTON BURNHAM, Oklahoma, Okla.
LAVOIZARE BLAIR CARUTHERS, Jr., Mercedes, Tex.
RALPH PARKER COBLE, Greensboro, N. C.
WILLIAM IRVING CONVERSE, Chicago, Ill.
ORVILLE WILFRID CROWLEY, Des Moines, Iowa
CHARLES PRENTISS DONALD, Fredonia, Kans.
EDWARD EVERETT DUFF, Jr., Pittsburgh, Pa.
GILES HAMILTON EDWARDS, Lancaster, Tex.
WILLIAM HENRY ENNIS, Philadelphia, Pa.
LEWIS NEBINGER FISHER, Decatur, Ill.
HENRY LOUIS FRUEND, Vandalia, Ohio
ALEXANDER GEIST, New York City
THEODORE GRAHLMAN, New York City
GEORGE BURKHART HILLS, Jacksonville, Fla.
WILLIAM REA HOLWAY, Tulsa, Okla.
BENJAMIN OLIVER HOOD, Newark, N. J.
CHARLES KANDEL, Newark, N. J.
RUDOLPH HOFFMANN KUGLER, Syracuse, N. Y.
ADOLPH LAWRIE KURTZ, Milwaukee, Wis.
JOHN ROBERT LAMBERT, Phoenixville, Pa.
RICHARD EUGENE LUTZ, Minneapolis, Minn.

JAMES FREW MAC TIER, Roanoke, Va.
 GEORGE RALPH MARCH, Philadelphia, Pa.
 CHALMERS CASS MILLER, Lorain, Ohio.
 ROBERT MONFORT MILLER, Ogden, Utah
 WILLIAM MARTIN MULHOLLAND, Cape Girardeau, Mo.
 CLYDE MYERS, Spokane, Wash.
 EMERET CLAUDE NEUDECKER, Oriskany Falls, N. Y.
 WILLIAM ALEXANDER OBENCHAIN, Dallas, Tex.
 WILLIAM SPRAGUE PARDOE, Philadelphia, Pa.
 LOUIS ERNEST ROBBE, Gilboa, N. Y.
 GEORGE EDWIN ROGERS, Dallas, Tex.
 DANIEL ROSS, Lewiston, Idaho
 CARL EVERETT ROUSE, Kansas City, Mo.
 SAMUEL DAVIS SARASON, Syracuse, N. Y.
 JAMES ROBERT SCANLIN, Philadelphia, Pa.
 HAL MCGINNIS SCOTT, Beckley, W. Va.
 WILBUR LOUIS SHARP, Portland, Ore.
 CLARENCE OWEN SHIVELY, Germantown, Ohio
 HOMER STANLEY SPARR, Shickshinny, Pa.
 HAROLD JAMES SPELMAN, Huntington, W. Va.
 HENRY AYLESBURY STRINGFELLOW, New York City
 HARRISON MORTON WATERMAN, New York City
 EZRA C. WENGER, Aurora, Ill.
 ARTHUR DANIELS WESTON, Boston, Mass.
 EPHRAIM BAILEY WILKINSON, Arkansas City, Kans.
 WILLIAM BILLINGS WILSON, Fort Sam Houston, Tex.
 CHARLES A. WINSTON, West Orange, N. J.
 EDWARD AINSLIE WOOD, Dallas, Tex.
 HORACE MELDRUM WOOLLEY, Jr., Alameda, Cal.
 CHARLES HENRY YOUNG, Muscatine, Iowa

AS ASSOCIATES

SAMUEL JOSEPH GARGES, New Rochelle, N. Y.
 JESSE HERBERT LIBBERTON, Chicago, Ill.
 HARRY ORRICK LOCHER, Utica, N. Y.
 WYNNE ALOYSIUS MURPHY, Philadelphia, Pa.

AS JUNIORS

ALEXANDER WINTON CAIRD, Boston, Mass.
 CHARLES HENRY CLARAHAN, Jr., Oak Park, Ill.
 ALFRED DEBOIS COLE, Elizabeth, N. J.
 ANGUS FERGUSON, Philippi, W. Va.
 HOWARD LESLIE FOSTER, Detroit, Mich.
 PERCY JULIAN GREENOUGH, Woodhaven, N. Y.
 ELLIS JOHNSON HATCH, New Britain, Conn.

ROBERT ARMENAC SCHROEDER, New York City

FRANCIS PAUL SCILEPPI, Pottstown, Pa.

HERMAN VICTOR NATHANIEL SIMPSON, Chicago, Ill.

YU-FONG PHILANDER SUN, Tientsin, China

MARNEY BEN WILLEY, Austin, Minn.

WALTER BENJAMIN WOOLSEY, Elizabeth, N. J.

The transfer of the following candidates on April 21st, 1920, was announced:

FROM ASSOCIATE MEMBER TO MEMBER

MILES CARLISLE BLAND, Harrisburg, Pa.

GEORGE RAYMOND CAMPBELL, Olympia, Wash.

CHARLES ANDREW CASE, Paris, Ill.

ELGA ROSS CHAMBLIN, Dallas, Tex.

PERCIVAL MITCHELL CHURCHILL, Dallas, Tex.

FRANCIS STIRLING CROWELL, New York City

WILLIAM EDWARD DAWSON, Springfield, Ill.

HARRY FRANKLIN FLYNN, Philadelphia, Pa.

BENJAMIN ALFRED HOWES, New York City

WILLIAM THOMAS HUBER, Buffalo, N. Y.

WILLIAM ALFRED LAMB, Helena, Mont.

JOHN CRANE McVEA, Houston, Tex.

JAMES TALBOTT MADISON, Beattyville, Ky.

FRANK ALWYN MARSTON, Boston, Mass.

LEON WADDELL MASHBURN, Clarksdale, Miss.

GEORGE CHENEY NEWTON, Milwaukee, Wis.

LEWIS MAGNUS NORELIUS, Philadelphia, Pa.

ALONZO ORRIN PEABODY, Santa Fé, N. Mex.

JAMES ROY PENNELL, Columbia, S. C.

JAMES HENRY POLHEMUS, Portland, Ore.

PAUL FRANCIS ROSSELL, Wilmington, Del.

JAMES ROBINSON SCOTT, Denver, Colo.

STEPHEN BARKER VERNON, Auburn, Pa.

ROSCOE GEORGE WALTER, Madison, Wis.

ROY IRVIN WEBBER, State College, Pa.

GEORGE WILLIAM CARLYLE WHITING, Baltimore, Md.

ROLLEN JOE WINDROW, Austin, Tex.

DAVID LEROY YARNELL, Washington, D. C.

FROM JUNIOR TO ASSOCIATE MEMBER

ROY LEONARD ANDERSON, West Berkeley, Cal.

GUY ATKINSON, New York City

CLEMENT EDWARDS CHASE, New York City

CHARLES ARMSTRONG CLARK, Kansas City, Mo.

HARRY WALDO COLE, Farrell, Pa.

HERBERT JUDSON FLAGG, Olympia, Wash.
GEORGE WASHINGTON GARDNER, Madison, N. J.
WALTER BERTON GRIGSBY, El Paso, Tex.
CECIL WARD HOWARD, Springfield, Ill.
MARION COLUMBUS HUOKABY, Covington, La.
GEORGE ALVIN HUNT, Edgewood, Md.
CLARENCE STRAIN JONES, Leavenworth, Kans.
FREDERIC OZANAM XAVIER McLOUGHLIN, New York City.
STUART FABIAN MAGOR, Whittier, Cal.
ALBERT CLARK MATTHEWS, Jr., Pittsburgh, Pa.
ALBERT AUGUST LAMBERT ORT, Philadelphia, Pa.
WILLIAM HENRI AUGUST FRANCIS POCKELS, Buenos Aires, Argentine Republic
RICHARD ELVIN JEWELL SUMMERS, Wilkinsburg, Pa.
THEODORE ERNST VELTFORT, Detroit, Mich.
LEE WENDELBOE, Ogden, Utah
FREDERICK JOHN WRIGHT, Paterson, N. J.

The following deaths were announced:

CHARLES ALDO ALDERMAN, of Lancaster, N. Y., elected Associate Member, April 6th, 1898; Member, April 2d, 1902; died March 11th, 1920.

WILLIAM WATSON COE, of Charles Town, W. Va., elected Member, April 3d, 1889; died March 31st, 1920.

JOSEPH BAKER DAVIS, of Dexter, Mich., elected Junior, April 1st, 1874; Member, October 5th, 1898; died March 9th, 1920.

FRANK LOUIS FULLER, of Wellesley Hills, Mass., elected Junior, April 4th, 1883; Member, April 4th, 1888; died January 30th, 1920.

AUGUSTUS VALENTINE SAPH, of San Francisco, Cal., elected Associate, October 1st, 1901; Associate Member, June 4th, 1907; Member, October 29th, 1912; died February 13th, 1920.

FRANK EDGAR OSBORN, of Muncie, Ind., elected Associate Member, December 31st, 1913; died March 17th, 1919.

Adjourned.

May 5th, 1920.—The meeting was called to order at 8.30 p. m.; Arthur S. Tuttle, M. Am. Soc. C. E., in the chair; Herbert S. Crocker, Acting Secretary; and present, also, 122 members and guests.

The minutes of the meetings of March 17th and April 7th, 1920, were approved as printed in *Proceedings* for April, 1920.

A paper by Allen Hazen, M. Am. Soc. C. E., entitled "Hydraulic-Fill Dams", was presented by the author and illustrated by lantern slides. The subject was discussed by Messrs. H. de B. Parsons, J. A. Holmes, George S. Binckley, Virgil H. Hewes, T. Kennard Thomson,

and the author. Written discussions by Messrs. Richard D. Chase, C. E. Curtis, Arthur E. Morgan, and G. A. M. Elliott were read, in part, by J. P. J. Williams, Assoc. M. Am. Soc. C. E. Mr. Parsons' and Mr. Holmes' discussions were illustrated by lantern slides.

The Acting Secretary announced the following deaths:

JOHN BOGART, of New York City, elected Member, February 17th, 1869; died April 25th, 1920.

GEORGE LYON CHRISTIAN, of Yonkers, N. Y., elected Associate Member March 6th, 1895; Member, October 3d, 1905; died April 25th, 1920.

HENRY CUYLER PARSONS, of Albany, N. Y., elected Member, October 6th, 1886; died April 5th, 1919.

EDGAR BEACH VAN WINKLE, of New York City, elected Member, December 2d, 1868; died April 27th, 1920.

Adjourned.

OF THE BOARD OF DIRECTION

(Abstract)

April 19th, 1920.—The Board met at 9.03 A. M., at the Hotel Congress, Chicago, Ill.; President Davis in the chair; H. S. Crocker, Acting Secretary; and, present, also, Messrs. Alvord, Beahan, Cummings, Curtis, Elwell, Fort, Grunsky, Henny, Hoyt, Hudson, A. M. Hunt, Ketchum, Marston, Marx, O'Connor, Pegram, Stuart, Talbot, Tuttle, Wagner, and Wall.

The report of the Chairman of the Publication Committee was presented, and the subject-matter was discussed in detail.

Based on the Acting Secretary's proposal of a change in publications whereby such papers as shall have appeared in *Proceedings* up to the May, 1920, issue, inclusive, will be published in a volume of *Transactions* for 1920, together with complete discussions of such papers, thus making June 1st, 1920, a closing date for the present form of *Proceedings*, Mr. A. M. Hunt offered the following motion:

"That the Publication Committee be instructed to present to the Executive Committee at the earliest date possible some plan whereby economy may be effected in manner and form of future publications, and that the Executive Committee be given power to determine such changes in order that if the Acting Secretary's further proposal of collecting and binding *Proceedings* into volumes of *Transactions*, without reprinting of papers and discussions, is adopted, the membership can receive sufficient notice of the impending change, and of the necessity of saving their *Proceedings* for subsequent binding."

Mr. Alvord, Chairman of the Committee on Special Committees, presented a report recommending that the Committee on the Regulation of Water Rights be discharged, and that no Special Committee on

Water Power Development be appointed at this time since its work would duplicate that being done by Engineering Council.

The report of the Committee on Special Committees was approved.

The action of Engineering Council in admitting the American Railway Engineering Association to its membership was approved.

In response to the representations of the Pittsburgh Association of Members the following resolution was unanimously adopted:

"Whereas: It has come to the attention of the Board of Direction of the American Society of Civil Engineers that the work of preparing plans and specifications for and in supervising the construction of bridges and other important engineering structures has been awarded to Architects, and

"Whereas: The work involved in the design of such structures is primarily engineering with respect to safety, cost, design, and adequacy, and

"Whereas: The procedure thus established is detrimental to the public interest, in that it subordinates the safety, adequacy, and cost of such structures to their appearance, therefore be it

"Resolved: That it is the opinion of the Board of Direction of the American Society of Civil Engineers that the responsibility for the design and construction of such work should be entrusted only to qualified Civil Engineers."

It was ordered that copies of this resolution be sent to both Engineering Council and the American Institute of Consulting Engineers, the latter having by resolution voiced a similar protest.

A request from ten members of the Society for the appointment of a Special Committee on "Specifications for Steel Bridge Design and Construction" was favorably considered, and referred to the Committee on Special Committees for report with recommendation of personnel.*

An invitation from the National Safety Council to the Society to act as joint sponsor with it in a "Safety Code on Construction Work" was referred to the Committee on Special Committees.

A decision was made to continue the Society's policy of representation at the general meetings of the American Association for the Advancement of Science.

Arrangement was made for publicity in *Proceedings*, and co-operation in the securing of subscriptions from members to "America's Gift to France."†

The President was authorized to appoint a representative to the Advisory Council of the U. S. Board of Surveys and Maps, which Board has been created to assist in the co-ordination of Federal map-making efforts.

* See p. 490.

† See p. 503.

A request from the Institution of Civil Engineers that the Society participate in the selection of the recipient of the Kelvin Medal for 1920 was referred to an appropriate committee.

Action was taken toward changing the names of all local "Associations of Members of the American Society of Civil Engineers" to "Sections of the American Society of Civil Engineers."

The Board expressed its concurrence with the views of its representative on the "Advisability of the Adoption of the Metric System", Dr. George F. Swain, to the effect that it does not agree with the policy of enforcing by legislation the use of the Metric System in industry.

Discussion was had regarding the question of the participation of the Conferees of the Society in the Call by the Joint Conference Committee for an Organizing Conference* to be held in Washington, D. C., on June 3d, 1920. Arrangements were made for a conference by the Board at 9 A. M., April 20th, 1920, with the representatives of the other Founder Societies attending their various meetings in Chicago.

Ballots for membership were canvassed, resulting in the election of 8 members, 60 Associate Members, 4 Associates, and 13 Juniors, and the transfer of 22 Juniors to the grade of Associate Member.

Twenty-eight Associate Members were transferred to the grade of Member.

Adjourned at 5.30 P. M. to meet at 9 A. M., April 20th, 1920.

April 20th, 1920.—The Board met at 9.08 A. M.; President Davis in the chair; H. S. Crocker, Acting Secretary; and, present, also, Messrs. Alvord, Beahan, Cummings, Curtis, Elwell, Fort, Grunsky, Henny, Hoyt, Hudson, A. M. Hunt, Ketchum, Marston, Marx, Metcalf, O'Connor, Pegram, Stuart, Talbot, Tuttle, Wagner, and Wall.

There were also present by invitation, to confer regarding the position to be assumed by the Founder Societies in connection with the proposed Call by the Joint Conference Committee for a proposed general federation of Engineering Societies, the following representatives:

Of the American Institute of Mining and Metallurgical Engineers: Past-President H. V. Winchell; Secretary Bradley Stoughton; and Directors G. H. Clevenger, A. S. Dwight, S. A. Taylor, and A. Thacher.

Of the American Society of Mechanical Engineers: President Fred J. Miller; Vice-President F. R. Low; Secretary Calvin W. Rice; and Directors E. S. Carman, R. H. Fernald, D. S. Kimball, G. A. Orrok, Chas. Russ Richards, and E. F. Scott; and

Of the American Institute of Electrical Engineers: President Calvert Townley and Director F. F. Fowle.

* See p. 480.

An informal discussion was participated in by Presidents Miller, Townley, and Davis, and by Messrs. Alvord, Carman, Dwight, Kimball, Lowe, Thacher, Winchell, and others, during which there developed a mutual desire by the other Societies for co-operation with the Society in any proposed joint undertakings.

The visitors left the meeting at 10.15 A. M., and the following motion was offered:

"That this Board of Direction without committing the Society in any way to the approval of the tentative draft of Constitution for the formation of a new organization submitted by the Joint Conference Committee instruct its representatives to urge the limitation of the Call to technical societies and to endeavor to secure a change in the Call and any tentative Constitution submitted which will make the representation of the National Societies the same as therein stated for the local societies and if they can secure such a change to join in the Call, and not otherwise, and that Delegates be sent to take part in that Conference in Washington with the understanding that this Society is not bound by anything that the Conference may do, but must submit, through this Board, to letter-ballot later the acceptance or rejection of the organization formed."

The motion was carried by a vote of 18 ayes to 5 noes.

The following resolution was also presented:

"*Resolved*: That if a modification of the Call for a Conference to be held in Washington be made as suggested by the resolution previously adopted by this Board, that the President of this Board be empowered to appoint a Committee of nine Delegates from members of this Society, of whom the President shall be one, to attend this Conference, and that the President of this Society shall be the Chairman of the Committee so appointed."

This resolution was carried by a vote of 16 ayes to 6 noes.

It was moved and carried, that:

"It is the sense of this Board that its Delegation to Washington present the plan outlined by the Special Committee of the Board of Direction for consideration at the Convention."

The following resolution was also unanimously adopted:

"*Resolved*: That if the Call to the Washington conference is not modified, the President is hereby directed to appoint representatives to this Conference to whatever number the American Society of Civil Engineers is entitled under the Call as issued.

"That the President shall be a member and Chairman of such Delegation of representatives, and,

"That the Delegation shall include members of the Joint Conference Committee to a number which shall be a minority of the Delegation and that this Delegation shall be instructed to make a statement to the Washington Conference at the earliest possible moment after the Conference convenes, giving the results of the vote of the recent

letter-ballot, and informing the conference that the American Society of Civil Engineers by such letter-ballot has negatived the plan of organization suggested by the Joint Conference Committee and that the Delegation has been appointed and is present to endeavor to secure such modifications of the plan as will warrant the submission of the plan finally adopted to the membership of the American Society of Civil Engineers to determine whether the American Society of Civil Engineers shall adhere to the organization that may be formed."

Previous action in fixing the Annual Convention at Houston, Tex., in October, was rescinded, because the holding of a convention at such a late date would preclude the possibility of adoption before the end of the year of certain constitutional amendments which are to be submitted to ballot as a result of the Questionnaire concerning the recommendations of the Committee on Development.

The following resolution was adopted:

"Resolved: That the Board of Direction of the American Society of Civil Engineers approves the Report of its Committee on Student Organizations, and authorizes the establishment of such organizations under the restrictions recommended by that Committee on Student Organizations."

Brig.-Gen. R. C. Marshall, Jr., was appointed as representative of the Society on the Washington Award Commission.

Other routine business was transacted.

Adjourned at 6.15 p. m.

April 21st, 1920.—The Board reconvened at 3.20 p. m.; President Davis in the chair; H. S. Crocker, Acting Secretary; and present, also, Messrs. Alvord, Elwell, Fort, Grunsky, Henny, Marx, O'Connor, and Wall.

A report from the Membership Committee was received and acted upon.

Adjourned.

ITEMS OF INTEREST

The Committee on Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

NATIONAL SERVICE DEPARTMENT OF ENGINEERING COUNCIL

In response to frequent expression of need, Engineering Council announces the establishment of a National Legislative and Departmental Information Service for engineers in all branches of the Profession. Information relative to engineering statistics, research, and construction, as well as of matters before Congress involving engineering considerations, will be furnished without charge by addressing M. O. Leighton, National Service Representative of Engineering Council, 502 McLachlen Building, Washington, D. C. This National Service Department of Engineering Council announces that its office at Washington is open to members of the Society at all times, and that accommodations can be had there at short notice for committee meetings of the Society, or of any organization in which the Society is interested, which may be held in Washington.

Results of Questionnaire on Report of Development Committee

The accompanying tabular statement gives the results, by geographical districts, of the questionnaire ballots on the Report of the Development Committee, canvassed April 14th, 1920. In addition to the figures reported to the Board of Direction by the Committee* delegated to canvass these ballots, the four lower rows in the table give the total vote on each question, the percentage of those voting on each who voted "yes", the number of geographical districts voting in favor, and the percentage of the total corporate membership (8 771, at the time the vote was canvassed) in favor of each question.

The results indicate that all except two of the questions (which are here reproduced) were carried in the affirmative, the percentage in favor varying from 69 to 85, although the number voting in favor varied around one-third of the total voting membership. Questions A-3 and B-7 were voted down by small majorities. It is of interest

* The report of the Committee, not including the table herewith, will be found on page 466.

to note the close votes in several districts, particularly in District No. 2, on Question A-3 and the tie votes in District No. 3 on Questions B-4 and B-5, also that Question B-3 received the largest favorable majority. The geographical districts are shown on the map in the 1920 Year Book of the Society, facing page 30; they are as follows:

- District No. 1.—Within 50-mile radius of New York City, and all outside of North America.
- District No. 2.—Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New Brunswick, Nova Scotia.
- District No. 3.—New York outside of District No. 1, and Quebec.
- District No. 4.—Eastern Pennsylvania, Maryland, New Jersey outside of District No. 1, Delaware.
- District No. 5.—District of Columbia, Virginia, North and South Carolina, Georgia, Florida.
- District No. 6.—Western Pennsylvania, West Virginia, Ohio.
- District No. 7.—Michigan, Wisconsin, Iowa, Minnesota, Manitoba, and Ontario.
- District No. 8.—Illinois, Indiana, Kentucky, Tennessee.
- District No. 9.—Alabama, Mississippi, Louisiana, Arkansas, Missouri.
- District No. 10.—Oklahoma, Kansas, Colorado, Utah, Nebraska, Wyoming, North and South Dakota, Montana, Saskatchewan, Alberta.
- District No. 11.—Texas, Mexico, New Mexico, Arizona, Southern California.
- District No. 12.—Idaho, Washington, Oregon, Alaska, Yukon Territory, British Columbia.
- District No. 13.—Northern California, Nevada.

QUESTIONS SUBMITTED ON QUESTIONNAIRE BALLOT.*

"A. EXTERNAL RELATIONS.

- "1. Shall the American Society of Civil Engineers 'adopt the principle of becoming an active National force in economic, industrial and civic affairs'? (See paragraph in Division C of Report at top of page 10.)
- "2. Shall the Society actively co-operate with other engineering and allied technical associations in promoting the welfare of the Engineering profession? (Report, Division C, pages 10-19.)
- "3. Shall the Society for the purposes set forth in Questions 1 and 2 actively co-operate in the creation of the comprehensive

* The "Report" referred to is the report of the Committee on Development dated October 14th, 1919; see *Proceedings*, Am. Soc. C. E., October-November-December, 1919, p. 889.

RESULTS OF QUESTIONNAIRE ON REPORT OF DEVELOPMENT COMMITTEE.

BALLOTS CANVASED UPON QUESTION:

Districts.	A. 1.		A. 2.		A. 3.		B. 1.		B. 2.		B. 3.		B. 4.		B. 5.		B. 6.		B. 7.	
	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.	Yes.	No.
No. 1. Resident...	472	238	568	132	214	572	484	219	468	236	568	176	411	392	408	381	518	222	460	267
1. Foreign...	472	238	568	132	214	572	484	219	468	236	568	176	411	392	408	381	518	222	460	267
2. ...	914	15	46	93	121	132	97	41	108	42	918	27	139	77	178	23	138	17	58	238
3. ...	914	15	46	93	121	132	97	41	108	42	918	27	139	77	178	23	138	17	58	238
4. ...	145	144	140	138	213	213	108	108	165	121	346	35	317	188	318	182	115	174	68	220
5. ...	358	26	366	27	273	108	346	26	394	42	346	35	317	188	318	182	115	174	68	220
6. ...	178	57	194	48	111	126	174	42	171	57	197	33	145	80	164	65	154	82	94	138
7. ...	306	70	324	55	237	134	308	46	302	61	332	39	288	79	300	69	284	87	116	246
8. ...	220	86	222	33	169	81	217	30	232	29	240	16	206	44	211	42	195	58	109	139
9. ...	222	47	228	33	131	150	211	39	216	48	238	31	191	73	196	67	183	73	128	139
10. ...	130	47	143	33	91	94	136	37	133	41	146	32	117	56	126	50	114	60	91	83
11. ...	135	86	139	32	89	82	129	31	139	27	152	15	119	49	128	39	105	60	66	101
12. ...	106	88	204	31	146	85	135	27	191	37	207	24	175	53	177	51	162	65	132	97
13. ...	129	20	130	20	59	58	132	16	136	20	131	18	116	39	116	28	98	66	80	80
14. ...	141	34	130	25	96	76	131	38	139	36	158	20	126	51	130	47	122	51	85	88
Total	2 839	910	3 115	635	1 867	1 954	2 384	711	2 854	831	3 176	567	2 561	1 130	2 613	1 091	2 583	1 149	1 701	1 976
Majority	1 979	2 430	.....	.....	87	2 135	.....	2 032	.....	2 009	.....	1 431	.....	1 522	.....	1 434	.....	.....	.....	275
Total vote.....	3 799	3 800	3 831	3 575	3 685	3 743	3 691	3 704	3 732	3 677	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Percentage voting "yes".....	76	82	49	80	77	85	69	70	69	46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Districts voting "yes".....	12	18	7	13	13	13	12 (1 tied)	12 (1 tied)	12	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Percentage of corporate member-ship voting "yes"	33	35	21	33	32	36	29	30	29	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Of those who voted on each question.

organization as outlined in the Joint Conference Committee Report? (Report, Division C, pages 10-19.)

"B. INTERNAL RELATIONS.

- "1. Shall the recommendations of the Committee on Development as to technical activities be adopted? (Report, Division A, Sections 1-5, pages 4-6.)
- "2. Shall local sections be created to embrace the entire membership of the Society? (Report, Division B, Section 1, paragraphs a, b, c and h, page 6.)
- "3. Shall the directors in each geographical district be nominated and elected by vote of the corporate members resident therein? (Report, Division B, Section 1, paragraphs e, f and g, page 6.)
- "4. Shall a portion of the Society dues be allotted to local sections? (Report, Division B, Section 1, paragraph i, page 6.)
- "5. Shall the present Nominating Committee be abolished and candidates for the offices of President, two Vice-Presidents and Treasurer be nominated by representatives of local sections in annual conference? (Report, Division B, Section 1, paragraphs j and k, pages 6-7.)
- "6. Shall the dues of all non-resident members above the grade of Junior be increased to provide for greater activities of the Society, said increase not to exceed \$5 per annum?
- "7. In case it should be found that the activities brought about by the movement to expand both the internal and the external work of the Society would require more funds than would result from the increase in dues contemplated in Question 6 of Internal Relations, would you favor increasing the dues of all non-resident members above the grade of Junior by an amount greater than \$5 but not greater than \$10 per annum?"

Engineer Appointed on Seattle Board of Public Works

Encouraging evidence that activity by committees of engineers in advocating the appointment of engineer members on important Boards or Commissions which have control over engineering work is seen by the fact recorded in the minutes* of the Seattle Section of Members that the new Mayor of Seattle had appointed Carl H. Reeves, M. Am. Soc. C. E., as Superintendent of Public Utilities. This is the first appointment made to the Board of Public Works; it followed an interview with the Mayor by a committee of the Section appointed for the purpose of urging that engineers be designated to fill any vacancies occurring on the Board of Public Works. It is significant that this committee has been continued and granted power to act officially for the Seattle Section in advising on any future appointments, on the request of the Mayor.

* See p. 521.

Joint Conference Committee Calls Meeting in Washington, D. C.

A call to 110 National, State and regional engineering organizations has been issued by the Joint Conference Committee of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, for an Organizing Conference to be held at Washington, D. C., June 3d and 4th, 1920. This action is taken pursuant to the resolution unanimously passed January 23d, 1920, at a joint meeting of the governing boards of the above named Societies and of the American Society for Testing Materials, also of the Trustees of United Engineering Society and Members of Engineering Council.

The purpose of the conference is to secure the co-operation of engineering and allied technical organizations to further the public welfare wherever technical knowledge and engineering training are involved, and to consider matters of common concern to these professions. All engineering organizations whose chief object is the advancement of the knowledge and practice of engineering and the allied technical arts and which were not organized for commercial purposes are expected to send delegates.

Although the call is issued by the Joint Conference Committee, the responsibility for perfecting a permanent organization rests with the delegates to the Conference. A plan of organization has been based upon the following principles:

"1.—Non-interference with the interrelations with respect to technical matters, and the maintenance of the autonomy, functions and operations, of individual organizations.

"2.—Local affiliation of existing groups of engineers in order to facilitate united action in local questions of public welfare and other matters of common interest.

"3.—National association of engineering organizations by means of a National Council composed of representatives widely chosen by local affiliations or organizations and by National organizations, meeting annually and acting through an Executive Board.

"4.—Financial support of such association by contributions from all participating organizations on a basis of membership.

"5.—A form of organization which will permit expansion and development."

As a basis of representation in the Organizing Conference, the following will be tentatively used:

"Each National organization will be entitled to one delegate for 100 to 1 000 members and an additional delegate for each additional 1 000 members or major fraction thereof. Each local, State or regional organization or affiliation is entitled to one delegate for 100 to 1 000

members and an additional delegate for each additional 1 000 members or major fraction. A local section, branch, chapter or association of a National organization will be represented through its National organization; this, however, shall not prevent its representation also as a part of a local affiliation."

ACTION ON REPORT OF JOINT CONFERENCE COMMITTEE

In addition to the resolution of approval passed at the Annual Meeting of the Society on January 21st, 1920, the following societies have taken action on the report of the Joint Conference Committee:

American Institute of Mining and Metallurgical Engineers.—At the Annual Meeting of the Institute on February 17th, 1920, the following resolution was adopted:

"RESOLVED: that the American Institute of Mining and Metallurgical Engineers, assembled in the annual business meeting, approves the principles of the report of the Joint Conference Committee, and authorizes its representatives on that Committee to act with that Committee in calling a meeting for the organization of the representative engineering body provided for in said report."

American Society of Mechanical Engineers.—In accordance with resolutions passed at the Annual Meeting in December, 1919, the Council of the Society passed the following resolution at its meeting on January 24th, 1920:

"VOTED: that the Council of this Society approves and adopts the report of the Joint Conference Committee and instructs its representatives to immediately start work to carry out the recommendations."

American Institute of Electrical Engineers.—The Board of Direction of the Institute at its meeting in December, 1919, passed the following resolution:

"VOTED: that the report (Joint Conference Committee) be endorsed and referred back to the Institute's three representatives on the Joint Conference Committee, for such action in co-operation with the representatives of such other Societies as endorse the report as may be necessary to put the recommendation into effect."

Engineers' Club of Philadelphia.—"RESOLVED: that the Engineers' Club of Philadelphia adopt the principles of the engineer becoming an active National force in economic, industrial and civic affairs, and with this purpose in view, pledges its active and cordial support in co-operation with other engineering organizations of the country in the development of a National Engineering Organization, as outlined in the report of the Joint Conference Committee, representing the A. S. C. E., A. I. M. E., A. S. M. E., and the A. I. E. E."

Cleveland Engineering Society.—"RESOLVED: that the Cleveland Engineering Society heartily commends and adopts the report made by the Joint Conference Committee of the four Founder Societies and

hereby authorizes its President to render such service as will aid in the speedy establishment of the proposed National inclusive engineering organization."

Engineers' Club of Columbus.—"The Engineers' Club of Columbus at its regular monthly meeting held February 24th, 1920, considered the report of the Joint Conference Committee, and authorized the appointment of a delegate to attend the coming conference of representatives of all engineering societies for the purpose of considering the formation of the organization as recommended in the Joint Conference Report."

Washington Society of Engineers, Washington, D. C.—At the meeting of the Board of Directors on January 6th, 1920, the following resolution was adopted:

"RESOLVED: that the Board of Directors of the Washington Society of Engineers favor the establishment of a single comprehensive National engineering organization, along the general lines proposed in the report of the Committee on Development of the American Society of Civil Engineers, dated October, 1919."

The Associated Engineering Societies of St. Louis.—At a special meeting of the Associated Societies the following resolution was made and carried:

"RESOLVED: that the Associated Engineering Societies of St. Louis endorse the recommendations of the Joint Conference Committee for a comprehensive and democratic organization of all Engineers, and stands ready to co-operate with other Engineering Societies in putting the proposed organization into effect, and authorizes the Joint Council of the Associated Engineering Societies of St. Louis to arrange for the election of a delegate and alternate as representatives to the National Conference to be called by the Joint Conference Committee."

Memorial Meeting in Honor of Andrew Carnegie

From the platform where he himself had once stood to dedicate the Engineering Societies Building which his generous contributions had helped to finance, Andrew Carnegie's life and work were commemorated in a memorial meeting on April 25th, 1920, by an unusual programme arranged by the Authors' Club, the New York Public Library, the Oratorio Society, the St. Andrew's Society, and the United Engineering Society. J. V. Davies, M. Am. Soc. C. E., President of the last-named Society, presided.

The principal speaker, the Hon. Elihu Root, said that Mr. Carnegie "belonged to that great race of nation builders who have made the development of America the wonder of the world", and that, after amassing his fortune, it was impossible for him to retire, so he turned his constructive energy to the use of the money he had accumulated,

never giving it away in the ordinary sense. Mr. Carnegie's very distinct understanding of the difficulty of making a good use of money and the danger of wasting it was mentioned in the course of Mr. Root's address; he also pointed out the definite conception held by Mr. Carnegie as to what would really contribute to human happiness, and continued:

"It did not enter his mind that he could make men happy by giving them money, but he had brought from his boyhood memories of the longings of the little Scotch weaver's boy. From the close, intimate contact with the poor, from the daily round of dreary toil, he had brought a knowledge of the human heart such as Lincoln brought to the problems of our country during the stress of the civil war from his experience as a boy.

"He was the kindest man I ever knew. Wealth had brought to him no hardening of the heart, nor made him forget the dreams of his youth. Kindly, affectionate, charitable in his judgments, unrestrained in his sympathies, noble in his impulses, I wish that all the people who think of him as a rich man giving away money he did not need could know of the hundreds of kindly things he did unknown to the world."

Dr. John H. Finley, Commissioner of Education of New York, told of Mr. Carnegie's apt description of himself when he wrote at one time that every Scotchman is two men, one hard of head and the other soft of heart, and said that the two men in Mr. Carnegie's case were held together in happy partnership by an American tolerance and an American sense of humor.

Letters containing heartfelt tributes from ex-President Taft, from Viscount Morley, and from Viscount Bryce—at one time British Ambassador to the United States—were read, and among many such tributes was one from Sir Oliver Lodge. Viscount Bryce wrote in part as follows:

"One of the leading elements in him was his implacable hatred of war as the only way or the best way of adjusting international quarrels. Passionate was his impatience with all the plausible sophisms and impious platitudes with which statesmen will strive to hide away their short sight, their costly blunders, their irremediable and uncompensated catastrophes."

The Oratorio Society, of which Mr. Carnegie long was President, furnished a musical programme including the "Peace Hymn of the Republic" by Henry Van Dyke, set to music by Walter Damrosch, which Mr. Carnegie had especially admired.

The memorial meeting was arranged by a committee which included Walter Damrosch, Cleveland H. Dodge, John Erskine, Rossiter Johnson, Dr. George F. Kurz, Lewis C. Ledyard, Henry Moir, Charles F. Rand, Calvin W. Rice, Charles M. Schwab, Alexander C. Humphreys, M. Am. Soc. C. E., and Mr. Davies.

Bill for Licensing Engineers Passes New York State Legislature

The State Legislature in April, 1920, adopted the bill licensing engineers in the State of New York. It is based upon Engineering Council's recommended uniform registration law,* with certain modifications and changes conforming to the provisions of existing law—a bill requiring the licensing of architects already having been enacted—and was signed by Governor Smith on May 14th, 1920. Upon request, a copy of the bill was forwarded by Edward H. Sargent, Assoc. M. Am. Soc. C. E., Albany correspondent of Engineering Council, and is here reprinted for the information of the membership.

AN ACT

TO AMEND THE GENERAL BUSINESS LAW, BY PROVIDING FOR THE LICENSING OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1.—Chapter twenty-five of the laws of nineteen hundred and nine, entitled "An act relating to general business, constituting chapter twenty of the consolidated laws," is hereby amended by inserting therein, after article four, a new article, to be article four-a thereof, to read as follows:

ARTICLE IV-A.

ENGINEERS AND SURVEYORS.

Section 37. Engineers and surveyors to be licensed.

38. Appointment of board.

39. Qualification and expenses.

39-a. Powers of the board.

39-b. Organization and meetings of the board.

39-c. Receipts and disbursements.

39-d. Records and reports.

39-e. Applications for and issuance of certificates.

39-f. Certificates.

39-g. Revocation and reissue of certificates.

39-h. Significance of certificate.

39-i. Unlawful acts and penalties.

39-j. Exemptions.

39-k. Corporations or partnerships.

39-l. Public work.

39-m. Land surveying.

SEC. 37. Engineers and Surveyors to Be Licensed.—In order to safeguard life, health and property, any person practicing or offering to practice professional engineering or land surveying in this state shall hereafter be required to submit evidence that he or she is qualified so to practice, and shall be licensed as hereinafter provided, and from

* Proceedings, Am. Soc. C. E., January, 1920, p. 32.

and after two years after this act becomes effective it shall be unlawful for any person to practice or to offer to practice professional engineering or land surveying in this state, unless such person has been duly licensed under the provisions of this act.

Nothing in this act shall be construed as requiring licensing for the purpose of practicing professional engineering or land surveying by an individual, firm or corporation on property owned or leased by said individual, firm or corporation unless the same involves the public safety or health.

SEC. 38. *Appointment of the Board.*—To carry out the provisions of this act there is hereby created a state board of licensing for professional engineers and land surveyors, hereinafter called the "board," consisting of five members, who shall be appointed by the regents of the university of the state of New York within sixty days after this act becomes effective. The members of the first board shall be appointed to serve for the following terms: one member for one year; one member for two years; one member for three years; one member for four years, and one member for five years. On the expiration of each of said terms the term of office of each newly appointed or reappointed member of the board shall be for a period of five years. Each member shall hold over after the expiration of his term until his successor shall be duly appointed and qualified. The regents may remove any member of the board for misconduct, incompetency or neglect of duty. Vacancies in the membership of the board, however created, shall be filled by appointment by the regents for the unexpired term.

SEC. 39. *Qualifications and Expenses.*—Each member of the board shall be a citizen of the United States and a resident of this state at the time of his appointment. He shall have been engaged in the practice of his profession for at least ten years and shall have been in responsible charge of work for at least five years. He shall be a licensed professional engineer. Each member of the board shall receive a compensation determined by the regents for attending sessions of the board or of its committees, and for the time spent in necessary travel, and, in addition, shall be reimbursed for all necessary traveling, incidental and clerical expenses incurred in carrying out the provisions of this act.

SEC. 39-a. *Powers of the Board.*—Each member of the board shall receive a certificate of appointment from the regents, and before beginning his term of office he shall file with the secretary of state the constitutional oath of office. Each member of the board first created shall receive a certificate of license under this act from the regents of this state. The board or any committee thereof shall be entitled to the services of the attorney-general, in connection with the affairs of the board, and the board shall have power to compel the attendance of witnesses, may administer oaths and may take testimony and proofs concerning all matters within its jurisdiction. The board shall adopt and have an official seal which shall be affixed to all certificates of license granted; and shall make all by-laws and rules not inconsistent with law needed in performing its duty.

SEC. 39-b. *Organization and Meetings of the Board.*—The board shall hold a meeting within thirty days after its members are first appointed, and thereafter shall hold at least two regular meetings

each year. Special meetings shall be held at such times as the by-laws of the board may provide. Notice of all meetings shall be given in such manner as the by-laws may provide. The board shall elect annually from its members a chairman, a vice-chairman and a secretary. A quorum of the board shall consist of not less than three members.

SEC. 39-c. *Receipts and Disbursements.*—The secretary of the board shall receive and account for all moneys derived from the operation of this act and shall pay them to the regents, and such portion thereof as shall remain after the payment of all expenses incurred by the board of examiners, the secretary of said board, and the board of regents, in carrying out the provisions of this act shall be paid into the state treasury.

SEC. 39-d. *Records and Reports.*—The board shall keep a record of its proceedings and a register of all applicants for registration showing, for each, the date of application, name, age, education and other qualifications, place of business and place of residence, whether or not an examination was required and whether the applicant was rejected, or a certificate of license granted, and the date of such action. The books and register of the board shall be prima facie evidence of all matters recorded therein. A roster showing the names and places of business and of residence of all licensed professional engineers and land surveyors shall be prepared by the secretary of the board during the month of December of each year; such roster shall be printed by the regents, and a copy mailed to and placed on file by the clerk of each city, town, village and county in the state.

SEC. 39-e. *Applications for and Issuance of Certificates.*—The regents shall, on application therefor, on prescribed forms and the payment of a fee of twenty-five dollars, except in cases where the applicant applies for license to practice professional engineering and land surveying, the fee shall be thirty-five dollars and on the recommendation of the board issue a certificate of license:

1. To any person who submits evidence satisfactory to the board that he or she is fully qualified to practice professional engineering or land surveying.
2. To any person who holds a like unexpired certificate of license issued to him or her by proper authority in any state or territory of the United States in which the requirements for the license or registration of professional engineers or land surveyors are of a standard satisfactory to the board;

Provided, however, that no person shall be eligible for license as a professional engineer who is under twenty-one years of age, who is not of good character and repute, and who has not been actively engaged for four or more years in the practice of professional engineering of a grade satisfactory to the board, and who shall not have had responsible charge of work as assistant for at least one year.

Provided, however, that no person shall be eligible for license as a land surveyor who is under twenty-one years of age, who is not a citizen of the United States, or who has not made declaration of his or her intention to become a citizen of the United States, who does not speak and write the English language, who is not of good character and repute, and who has not been actively engaged for three or more

years in the practice of land surveying of a grade satisfactory to the board.

However, each two years of study, satisfactorily completed, of engineering in a school of engineering of standing satisfactory to the regents shall be considered as equivalent to one year of such active practice.

Unless disqualifying evidence be before the board, the following facts established in the application shall be regarded as *prima facie* "evidence, satisfactory to the board," that the applicant is fully qualified to practice professional engineering or land surveying:

- (a) Six or more years of active engagement in professional engineering work, one of which shall have been in responsible charge of work, or in the case of applicants for license as a land surveyor, four or more years of active engagement in land surveying work of a character satisfactory to the board;
- (b) Graduation, after a course of not less than four years in engineering from a school or college approved by the regents as of satisfactory standing, and an additional four years of active engagement in professional engineering, one of which shall have been in responsible charge of work, or two years of active engagement in professional land surveying of a character satisfactory to the board.

Applicants for license, in cases where the evidence originally presented in the application does not appear to the board conclusive or warranting the issuance of a certificate, may present further evidence, which may include the results of a required examination, for the consideration of the board.

In determining the qualifications of applicants for license as professional engineers or land surveyors a majority vote of the members of the board shall be required.

In case the board denies the issuance of a certificate to an applicant, the license fee deposited shall be returned by the regents to the applicant.

SEC. 39-f. *Certificates*.—The result of every examination or other evidence of qualifications, as provided by this article, shall be reported to the board of regents by the board of license, and a record of the same shall be kept by the board of regents and the board of regents shall, unless deemed otherwise advisable, issue a certificate of license to every person certified by the board of license as having passed such examination or as being otherwise qualified to be entitled to receive the same.

SEC. 39-g. *Revocation and Reissue of Certificates*.—The regents shall have the power, on the recommendation of the board, to revoke the certificate of license of any professional engineer or land surveyor licensed hereunder who is found guilty of any fraud or deceit in obtaining a certificate of license or of gross negligence, incompetency or misconduct in the practice of professional engineering or land surveying. Any person may prefer charges of such fraud, deceit, negligence, incompetency or misconduct against any professional engineer or land surveyor hereunder; such charges shall be in writing and sworn

to by the complainant and submitted to the board. Such charges, unless dismissed without hearing by the board as unfounded or trivial, shall be heard and determined by the board within three months after the date on which they are preferred. A time and place for such hearing shall be fixed by the board. A copy of the charges, together with a notice of the time and place of hearing, shall be legally served on the accused at least thirty days before the date fixed for the hearing, and in the event that such service cannot be effected thirty days before such hearing, then the date of hearing and determination shall be postponed as may be necessary to permit the carrying out of this condition. At said hearing the accused shall have the right to appear personally and by counsel and to cross-examine witnesses against him or her and to produce evidence and witnesses in his or her defense. If after said hearing three or more members of the board vote in favor of finding the accused guilty of any fraud or deceit in obtaining a certificate or of gross negligence, incompetency or misconduct in the practice of professional engineering or land surveying, the board shall recommend to the regents the revocation of the certificate of license of the accused.

The regents may, on recommendation of the board, reissue a certificate of license to any person whose certificate has been revoked.

The regents shall immediately notify the clerk of each incorporated city, town, village and county in the state of its revocation of a certificate of license or of its reissuance of a revoked certificate of license.

A new certificate of license to replace any certificate lost, destroyed or mutilated, may be issued, subject to the rules and regulations of the board. A charge of one dollar shall be made for such reissue.

SEC. 39-h. *Significance of Certificate; Seals.*—The issuance of a certificate of license by the regents shall be evidence that the person named therein is entitled to all the rights and privileges of a licensed professional engineer or land surveyor, while the said certificate remains unrevoked.

Each licensee hereunder may upon being licensed obtain a seal of the design authorized by the board, bearing the licensee's name and the legend "licensed professional engineer or licensed land surveyor." Plans, specifications, plats and reports issued by a licensee may be stamped with said seal during the life of licensee's certificate, but it shall be unlawful for any one to stamp or seal any documents with said seal after the certificate of the licensee named thereon has been revoked unless said certificate has been renewed or reissued.

SEC. 39-i. *Unlawful Acts and Penalties.*—Any person who after this act has been in effect two years is not legally authorized to practice professional engineering or land surveying in this state according to the provisions of this act and shall so practice, or offer so to practice, in this state, except as provided in section thirty-nine-j of this act, and any person presenting or attempting to file as his own the certificate of license of another, or who shall give false or forged evidence of any kind to the board, or to any member thereof, in obtaining a certificate of license, or who shall falsely impersonate any other practitioner, of like or different name, or who shall use or attempt to use an unexpired or revoked certificate of license, shall be deemed guilty

of a misdemeanor and shall for each such offense of which he is convicted be punished by a fine of not less than one hundred dollars nor more than five hundred dollars, or by imprisonment for three months, or by both fine and imprisonment.

SEC. 39-j. *Exemptions.*—The following shall be exempted from the provisions of this act:

1. Offering to practice in this state as a professional engineer or land surveyor by any person not a resident of and having no established place of business in this state.
2. Practice as a professional engineer or land surveyor in this state by any person not a resident in this state and having no established place of business in this state, provided that said person is legally qualified for such professional service in his own state or country where the necessary qualifications for which in said state or country meet the requirements of the board of regents.
3. Practice as a professional engineer or land surveyor in this state by any person not a resident of and having no established place of business in this state, or any person resident in this state, but whose arrival in the state is recent; provided, however, such a person shall have filed an application for license as a professional engineer or land surveyor, and shall have paid the fee provided for in section thirty-nine-f of this act. Such exemption shall continue for only such reasonable time as the board requires in which to consider and grant or deny the said application for license.
4. Engaging in professional engineering or land surveying as an employee of a licensed professional engineer or a licensed land surveyor, or as an employee of a professional engineer or land surveyor authorized by paragraphs two and three of this section, provided that said practice may not include responsible charge of design or supervision as principal.
5. Practice of professional engineering or land surveying solely as an officer or as an employee of the United States.
6. Practice of professional engineering or land surveying solely as an employee of this state or any political subdivision thereof, at the time this act becomes effective and thereafter only until the expiration of the then existing term of office of such employee.

SEC. 39-k. *Corporations or Partnerships.*—A corporation or partnership may engage in the practice of professional engineering or land surveying in this state, provided the person or persons connected with such corporation or partnership in charge of the designing or supervision which constitutes such practice is or are licensed as herein required of professional engineers or land surveyors. The same exemptions shall apply to corporations and partnerships as apply to individuals under this act.

SEC. 39-l. *Public Work.*—Two years after this act goes into effect, no county, city, town or village or other political subdivision in the

state, shall engage in the construction or maintenance of any public work involving professional engineering or land surveying for which plans, specifications and estimates have not been made by, and the construction and maintenance supervised by, a licensed professional engineer or land surveyor; provided, that nothing in this section shall be held to apply to such public work wherein the contemplated expenditure for the completed project does not exceed two thousand dollars.

SEC. 39-m. Land Surveying.—Land surveying as covered by this act refers to surveys for the determination of areas or for the establishment or re-establishment of land boundaries and the subdivision and platting of land. Nothing in this act shall be construed as prohibiting licensed professional engineers from making land surveys where such surveys are essential to engineering projects, nor as prohibiting any person from doing land surveying provided he does not hold himself out to be a licensed land surveyor.

Section 2.—All laws or parts of laws in conflict with the provisions of this act are hereby repealed.

Section 3.—This act shall take effect immediately.

Proposed Committee on Specifications for Steel Bridges

The following letter was considered by the Board of Direction of the Society at its meeting in Chicago on April 19th, 1920, and the request for the appointment of a committee on specifications for steel bridges was referred to the Committee on Special Committees:

"NEW YORK, APRIL 12TH, 1920.

"TO THE BOARD OF DIRECTION,

"AMERICAN SOCIETY OF CIVIL ENGINEERS,

"33 West 39th Street, New York City.

"GENTLEMEN:

"The American Society of Civil Engineers has, in years past, taken steps to simplify and to establish the engineering practice in important branches of work. Notably the rail and the cement committees, whose work promoted the best engineering practice, reflected credit upon the Society.

"To-day the practice of bridge design is passing through an evolution and needs similar guidance. At the present time many matters of general specification need authoritative acceptance. This Society seems to be the only engineering organization which is free from extraneous influences, and the duty devolves upon it to formulate a uniform practice in this branch of engineering work, as it has already done in others.

"In consideration of the foregoing, we respectfully request that a special committee be appointed to consider and to recommend for adoption a specification for steel bridge design and construction. Such a committee should review and accept any desirable work which has been done elsewhere, and it should devise any other provisions which it may deem advisable.

"The committee, if composed of men selected from those who have had practical and responsible experience in the design, construction and maintenance of bridges, will have the confidence of engineers. It is believed that if its members are permitted to select their own chairman, each will feel his individual responsibility for the results attained.

"Respectfully yours,

"(Signed)

GEO. H. PEGRAM
J. E. GREINER
PAUL L. WOLFEL
H. R. LEONARD
GUSTAV LINDENTHAL
CHAS. E. FOWLER
JAMES B. FRENCH
J. R. WORCESTER
W. H. FINLEY
HENRY B. SEAMAN."

Western Society Entertains Members of Boards of Direction of Founder Societies

At the suggestion of the Board of Direction of the Western Society of Engineers, the governing boards of three of the Founder Societies, together with members of the Board of the American Institute of Electrical Engineers, met in Chicago, Ill., on April 19th, and 20th, 1920, and were entertained by the Western Society. At a dinner in the Banquet Room of the Hotel La Salle on April 19th, at which A. Stuart Baldwin, M. Am. Soc. C. E., Past-President of the Western Society, presided, evidence of society unity and co-operation was forthcoming. Addresses were made by President Arthur P. Davis, for the Civil Engineers; Arthur Thacher, Director, representing President Herbert C. Hoover of the Mining Engineers, who was unavoidably absent; President Fred J. Miller, for the Mechanical Engineers; and President Calvert Townley, for the Electrical Engineers. Mr. Townley urged unselfish public service as the ideal to strive toward in the effort to solve the serious problem of how to develop team work among engineers, and concluded by saying: "The war was called an engineers' war. Let us make peace an engineers' peace."

Dr. Theodore G. Soares, head of the Department of Theology of the University of Chicago, made an impressive address, emphasizing the great responsibility of engineers and engineering teachers. The tremendous growth in the complexity of modern life requires abler advice than ever before. Real democracy must accept and provide proper scope for the expert; votes must be weighed as well as counted. The engineer, he said, must be less modest, he must be more than an expert witness—he must prescribe, order and see that his orders are carried out.

At the luncheon on April 20th, President Townley introduced the speakers, Edgar S. Nethercut, M. Am. Soc. C. E., Secretary of the Western Society of Engineers and Presidents Davis and Miller. Mr. Nethercut, in the absence of President F. R. Copeland, presented a comprehensive account of the history and the present activities of the Western Society and pointed to the accomplishments of that Society in relation to the provisions in the report of the Joint Conference Committee. The following extracts from Secretary Nethercut's address are of special interest:

HISTORY AND ACTIVITIES OF WESTERN SOCIETY OF ENGINEERS

"This Society celebrated the fiftieth anniversary of its organization last year. It was organized in 1869 as the Civil Engineers Club of the Northwest, it being the third engineering society in America. The name and form of organization was changed in 1880 when it became the Western Society of Engineers. The change in name indicates the inclusion of the branches of engineering which were being recognized as distinct from civil engineering. The name also indicated a feeling that western engineers needed a society with headquarters in the Central States. The requirements for admission are as high as those of any National Society.

"The progress of the Society was uniform and satisfactory for many years. Due to normal growth the membership doubled each ten years up to 1909. The statistics show that subsequent to 1909 the membership did not increase normally or in proportion to the increase in engineering population. During our extensive membership campaign last year, we received approximately as many applications for membership as during the previous fifty years.

"There was appointed by this Society last year a Committee on Development to co-ordinate a plan for the various proper activities. In the matter of membership it developed that a really small percentage of the engineering population of Chicago were members of our Society; likewise a really small percentage of the local members of the National societies were in our Society. The figures were as follows:

A. I. E. E.....	9%
A. S. M. E.....	10½%
A. I. M. E.....	12½%
A. S. C. E.....	36½%

"It is also developed that social relations could be well advanced by the alignment of the membership on non-technical lines for the proper consideration of our civic relations where engineers of experience could assist in the proper solution of our local problems and discharge an important civic duty. It was felt that such activities would greatly assist in the estimate which we would place on ourselves, and also raise the estimate of the engineer in the eye of the public. Material welfare of the engineer would be advanced by the broadening of his technical knowledge, forming acquaintances, providing for social intercourse by these activities in the interests of the public.

"Without attempting to change the basic form of our organization, or even change the name of our Society, there has been developed an organization along the lines recommended by our Development Committee. The all-inclusive character has proven sound. At the inception of our membership campaign last fall the question before the engineers of Chicago was 'should we have and do we believe in an all-inclusive Society with actual membership, the alternative being to organize on the federation plan?' The success of our membership campaign was a complete and positive answer that the opinion of the Chicago engineers was in favor of the plan of the Western Society.

"It is estimated that there are at least 6 000 technical men connected with the profession in Chicago. At the present time about 50% are included in our membership. The percentage of members of National societies in Chicago who are members of the Western Society is now approximately 50. We believe that it is proper to expect that this may be increased to more nearly 100% when the principle laid down by Mr. Calvin W. Rice and other leaders in society activities that 'an engineer should first become a member of his local society and later join the National society of his specialty' will be thoroughly appreciated and acted upon.

"In this connection, I wish to call attention to a service that the local society can render to the National society by emphasizing the value of membership in the National society, it being always understood that a man's professional standing is registered by his membership in a National society. In order to assist we carry at our office application blanks for the use of those who are interested in joining the National societies. An analysis of our membership roll indicates a surprisingly large number of engineers who are well qualified for membership in a National society, but who have evidently not given this matter proper consideration.

"The real active work of the Society is carried on by our regular committees of over 200 of our members, in very few instances are any assigned to more than one committee. These committees can be grouped in five classes: *A*, Administrative; *B*, Technical Sections; *C*, Departmental; *D*, Welfare; *E*, Applied Technical.

"The Administrative Committees are Finance, Membership, Amendments, Permanent Quarters, Affiliation, Development, Student Branches, Increase of Membership. The duties of each is sufficiently indicated by the name.

"The Technical Sections now organized are Electrical; Bridge and Structural; Hydraulic, Sanitary and Municipal; Mechanical; Gas, and Railway. The sections that have been authorized and are now in process of organization are: Telephone and Telegraph, Industrial and Chemical. Each technical section holds its stated meetings. Over fifty meetings are scheduled for each year. These are generally held on Monday evening and convene at 7 o'clock. The first Monday evening of each month is designated as a general meeting of the Society at which time the subjects covered are on the broader engineering matters. The executive committee of each section is in charge of its programme. Our technical meetings are often held jointly with the Chicago sections of the National societies. This has proven very

satisfactory and was originated by our Electrical Section jointly with the Chicago Section of the A. I. E. E. As fast as possible this is being extended to the other branches of engineering.

"The Departmental Committees are Library, Programme, and Publication. On the Programme Committee are the Chairmen of each technical section and on the Publication Committee are the Vice-Chairmen of each technical section.

"Before describing the Welfare Committees this word 'welfare' should be defined. There seem to be two ideas with regard to this. By some it is considered to include that work of technical societies which tends directly towards the personal advancement of the engineers in material things. The other idea is that it is such work as engineers combined in a society can do which has as its first aim service to the community and which we recognize will in the end be most successful in promoting the interests of the profession. The Western Society is placing its emphasis on the second interpretation.

"The Welfare Committees (this term being used in absence of a better and more descriptive term) are Public Affairs; Entertainment; Excursion; Reception; Military; Noon-day Luncheon; Speakers' Bureau; Licensing and Registration, and a Committee on Military Affairs. Included in this group is a Young Men's Forum which provides an opportunity for informal discussion among our younger members of the particular problems of their professional advancement. The Public Affairs Committee is sub-divided as follows: Constitutional Convention, City Zoning, Highways, Engineering Employment and Smoke Abatement.

"The Applied Technical Committees consist of the following: Terminals—Rail and Water; Inland Waterways; Aviation; Fire Prevention and Protection; National Department of Public Works; Engineering and Experiment Research at the University of Illinois; and Materials and Methods. The Applied Technical Committees enable a regrouping of our membership so as to bring together men from the various technical branches who are interested in common problems. The grouping of our Welfare Committees is likewise irrespective of technical specialties and this regrouping itself greatly increases the acquaintance and friendly relations among our members.

"Through these various committees and the activities of the same the Western Society of Engineers is now recognized as a civic body, and we are acting jointly with other civic bodies in Chicago, such as the Bureau of Public Efficiency, the City Club, the Union League Club, and the Association of Commerce. Jointly with the Association of Commerce, we have a committee who are making a study of the city water supply.

"The Western Society in recognition of its position and desire to be of greatest service to the National Societies is preparing to offer to the local sections clerical services and central permanent headquarters to care for the correspondence and activities of the section under the supervision of the Local Secretaries.

"During the war there was organized in Chicago a War Committee of Technical Societies. This committee consisted of representatives

of nineteen societies, including the Chicago sections of National societies. It proved during the war very efficient and effectual in unifying our work. At the close of the war it was felt advisable to continue this committee, and the name was changed to the General Committee of the Technical Societies of Chicago. Through this committee co-operative effort is readily cared for. The co-ordination, however, of the Profession in Chicago will undoubtedly be best affected by personal membership in the local Society.

"Engineering societies, local and National, have each a responsibility for the proper recognition of the Profession and the advancement of its membership. There exists at the present time, in addition to the National organizations, a considerable number of local groups with various forms of organization. In order to correlate the activities of all of these societies, or associations of local societies, and in order that the proper functioning of each can be established, a simple and direct interrelation is being considered at this time.

"As a foundation for this the local society, all inclusive in its scope of membership, with close personal relationship, and direct contact of the members with each other and with the direct and definite local problem, should be considered. The National technical society, which gives the stamp of professional standing upon its members, can lead in the advancement of technical attainment with a direct relation with each local Society through its Local Sections. The government of the local Society should be usually in the hands of those who are responsible for the government of the local section of the National societies.

"The recommendations of the Joint Conference Committee's report provides for local association of engineering societies in each locality as a basis of the organization of a nation wide association, and while it permits a local society, such as the Western Society, to form a center of grouping it seems to overlook the fact that in a city like Chicago this might have the effect of divorcing considerable support from the local society. It also overlooks the fact that in many of the smaller communities where National societies are represented by a comparatively small number of men, it would be quite impossible to organize along the affiliation plans successfully unless it be with the central idea of a social club. The advancement of the Profession has always been best promoted by emphasis upon the technical advancement, the social and material things are secondary, but important; for this reason we recommend the consideration of the local technical society as a basis."

Advisory Council, U. S. Board of Surveys and Maps

Following a communication from E. B. Mathews and M. O. Leighton, M. Am. Soc. C. E., who had been delegated by the United States Board of Surveys and Maps* (which held its first public meeting on March 9th, 1920), to request action in the matter, the Board of Direction of the Society authorized President Arthur P. Davis to

* *Proceedings, Am. Soc. C. E., January, 1920, p. 59, and February, 1920, p. 261.*

appoint a representative of the Society to act on the proposed Advisory Council. This Council is to function with the Board in an effort to co-ordinate State, municipal, corporate and private map-making activities with the work of the Federal Government.

ACTIVITIES OF ENGINEERING COUNCIL

Strong Support Given to Nolan Bill at Senate Hearing

Largely as a result of the appeal made to the members of the National Societies asking that they write to Senators in support of the Nolan Bill, H. R. 11 984, which passed the House of Representatives on March 5th, 1920, an impressive demonstration was made at a hearing before the Patent Committee of the Senate on April 8th. Thousands of letters and telegrams had been received by the Senators. At the hearing, Edwin J. Prindle, Chairman of the Patent Committee of Engineering Council which issued the appeal to member societies, called attention to the large body of representatives of various organizations present (about 80 persons attended the hearing), and Senator George W. Norris, Chairman of the Senate Committee on Patents, asked if any one appeared in opposition to the bill. No word of opposition to the general bill was heard, but the amendment relating to the apportionment of profit and damages for infringement, etc., was contested.

Every witness urged immediate action on the original Nolan Bill in order that relief of the Patent Office could be had at once in the form of increased salaries and an augmented force. It is evident that the letters and telegrams which were sent to Senators as a result of the appeal to members of the National Societies by Council's Patents Committee have been a powerful factor in persuading many Senators that the bill should be passed.

Aid for Austrian Engineers

There have been referred to Engineering Council by some of its member societies, by other organizations and by individuals, several appeals for aid to Austrian engineers. Consequently, at its meeting April 29th, 1920, Council voted to instruct its Secretary to prepare an appeal and transmit it to the member societies with request for publication.

A letter from the Austrian Society of Engineers in Private Practice, Vienna, Austria, is representative of the appeals for food:

"FELLOW CRAFTSMEN:

"Austria is hungry! The supply of foodstuffs available is less than half enough. Hunger has lowered the standard of our work and has

undermined us so physically that we can do nothing toward improving ourselves. We turn to America as the only state which can help us in our distress; the only nation in the world that can keep us from starving.

"There are 1 000 members in our organization in Austria in the various branches of engineering, such as electrical, mechanical, civil, mining, architectural and chemical. Approximately half of our members are wholly without employment, but even those who have work receive only on an average of 1 500 kronen a month, a little more than \$5.00.

"Through the American Relief Administration a means is provided for furnishing us with food. Americans can buy food drafts at any bank in America and send them to us by registered mail. On presentation of these drafts in Austria, the American Relief Administration Warehouse will deliver to us stipulated quantities and kinds of American food shipped to Austria for that purpose.

"The American Relief Administration has had post-cards printed to be sent to relatives and friends in America. These cards tell how you can help us. We guarantee that all food received from food drafts sent to us from America will be distributed equitably among our members under direct supervision of the American Relief Administration representatives in Austria.

"YOU ARE OUR PROFESSIONAL BROTHERS—AND WE ASK YOU TO STAND BY US IN OUR HOUR OF NEED. WE APPEAL TO YOU, FELLOW CRAFTSMEN, ACROSS THE SEA, TO SEND US FOOD DRAFTS, LEST WE STARVE!"

For further information apply to the American Relief Administration, 115 Broadway, New York, or to your own or the nearest bank.

There are also appeals for technical literature. The following paragraphs are from a letter dated February 8th, 1920, by Fritz von Emperger, to William Mueser, M. Am. Soc. C. E., New York City. Mr. von Emperger is an American citizen and was known to many engineers in the United States. He was formerly a member of the American Society of Civil Engineers. This request is made on behalf of the Austrian Society of Engineers and Architects, Eschenbachgasse 9, Vienna, Austria.

"We Germans in general and Austrians in particular cherish the belief that upon this occasion we may properly point to old cultural relations with the United States, and the hope that we will not be refused by our American colleagues in asking them for some mental food. The gratification of our desire would not seem to be difficult of accomplishment, since a selection of a few of the newer books of technical value, in addition to 'back numbers' of engineering journals, would supply the need.

"We venture to ask for such back numbers for the period since intellectual intercourse with the Central European continent was cut off. In fixing this time, I can state that as early as 1915, it was necessary for me to make use of the diplomatic pouch of the American Embassy to forward a paper prepared by me for the International Engineering Congress at San Francisco."

Preparation of Legal Papers by Engineers

The New York Court of Appeals recently handed down an opinion which seemed to restrict the drawing of legal documents to persons possessing the right to practice law. This raised a question in the minds of some engineers as to whether engineers and architects could continue in New York State to prepare contracts and certain other legal or semi-legal documents as has been their practice hitherto. Such a request was referred by the American Society of Mechanical Engineers to Engineering Council. At the request of Chairman Channing, Secretary Alfred D. Flinn sent the papers relating to a recent decision of Justice F. E. Crane, concerning the preparation of contracts and other legal instruments by persons other than attorneys and counselors-at-law, to Messrs. Parker and Aaron, lawyers, of New York City. Their reply, in part, is as follows:

"In *People vs. Title Guarantee & Trust Co.*, 227 N. Y., p. 366, a similar question arose in the prosecution against the Title Guarantee and Trust Company for drawing deeds and similar instruments in connection with their business of insuring titles to real estate, and the court held that such action did not violate the statute. The court says:

"We know that in cities constantly men engaged in the real estate business and banks have prepared for their customers such instruments without doubt or criticism. The legislature when it enacted not only section 280 of the Penal Law, which we have been considering, but also section 270 relating to the practice of law by an individual without being admitted and registered, was charged with the same knowledge of prevailing customs and practices with which we are chargeable. Its members knew, oftentimes doubtless by practical and personal observation and experience, that laymen throughout the state were rendering such services as are here involved. Not only by practice and custom but by inherent privilege they had the right to do this unless forbidden by statute, and if the legislature intended to prohibit a widespread practice and establish a new rule it was its duty to say so clearly and unmistakably in the statute relating to the practice of law and rendition of legal services by individuals. It did not say so and in my opinion there is not to be found in that section of the Penal Law any provision against the rendition of such services by an individual. We think the same idea is emphasized as in section 280 that an individual who is not admitted to practice must not assume the character of an attorney at law. He is forbidden to practice or appear 'as an attorney at law or as an attorney and counselor at law' or to make it a business to practice 'as an attorney at law or an attorney and counselor at law' or to hold himself out to the public as being entitled 'to practice law as aforesaid or in any other manner' or 'to assume to be an attorney or counselor at law'. But there is nothing which can fairly be regarded

as indicating an intention to abolish an existing and widespread practice and to prevent a layman as such and without any simulation of or pretense to the character of an attorney from drawing a simple instrument as instructed by his customer and not involving or predicated upon any legal advice then given.'

"Engineers having special knowledge of the engineering work required and the professional skill enabling them to express it, are not precluded as an incident in the practice of their profession from preparing 'contracts for engineering work as has been the common practice for years'. By so doing they are not holding themselves out as practicing law and are not practicing law."

H. R. Safford to Represent American Railway Engineering Association

As already announced,* the American Railway Engineering Association has accepted an invitation to become a member society of Engineering Council. The Association has named its President, H. R. Safford, M. Am. Soc. C. E., to represent it. He was recently appointed Assistant to President Hale Holden, of the Chicago, Burlington and Quincy Railroad Company, the Colorado and Southern Railway Company, the Fort Worth and Denver City Railway Company, and The Wichita Valley Railway Company. He was formerly Chief Engineer of the Grand Trunk Railway, and is well known in Canada as well as in the United States. Following the severance of his connection with the Grand Trunk Railway, he became Assistant to the Regional Director, United States Railroad Administration, Chicago, Ill.

The Societies now represented in Engineering Council have an aggregate membership of 45 000.

Notes from National Service Department

LEGISLATIVE, EXECUTIVE AND JUDICIAL APPROPRIATION BILL

This bill, as finally passed by Congress, provides \$60 000 for enforcing the wireless communication laws, and \$30 000 for investigation and standardization of methods and instruments used in radio communication by the United States Bureau of Standards. The sum of \$25 000 is provided for the continuation of the present investigations on the production of optical glass; \$25 000 is allowed for metallurgical research; \$30 000 for testing chemicals, etc., and \$10 000 for the development of color standards and color measurements.

The structural materials investigation which has been carried on at the U. S. Bureau of Standards, and which pertains largely to cement, is provided with an additional \$125 000, and \$25 000 is appropriated for

* *Proceedings, Am. Soc. C. E.*, April, 1920, p. 405.

investigation of fire-resisting properties of building materials and conditions under which they may be most efficiently used. For the further investigation of standards of practice and methods of measurement in the public utilities, such as gas, electric light and power, water, telephone, central station heating, and electric railway service, there is appropriated \$85 000. The sum of \$40 000 is authorized to be used in the standardization and testing of gauges, screw-threads, and standards required in manufacturing; \$15 000 additional is to be used for development of methods of testing and standardizing machines, motors, tools, measuring instruments, and other apparatus and devices used in mechanical, hydraulic and aeronautic engineering.

NEW RAILROAD CLASSIFICATION OF SUBORDINATE ENGINEERS

The Interstate Commerce Commission has held lengthy hearings on the classification of engineer assistants in railroad employ, and as a result has issued regulations classifying subordinate officials as provided in the Transportation Act. These engineers are grouped into one class called "Engineers of Mechanics". This class includes civil engineers inferior in rank to Engineers of Maintenance of Way, Chief Engineers or Division Engineers, that is, draftsmen, engineers on maintenance-of-way work, and other engineers of mechanics, who are not vested with authority to employ, discipline or dismiss subordinates.

Representatives of the American Association of Engineers, the membership of which includes many engineers in this class, presented arguments in favor of a separate grouping for subordinate technical engineers. It was stated that 20 000 technical engineers in the employ of the railroads would be included in such classification, whereas only 5% of that number are engineers that come within the category of executives, and that no other class of railroad employees have a more trusted relationship with their companies than the assistant engineers, architects, rodmen, chainmen and draftsmen. Because of the fact that this class of engineers have previously had no classification, they have received practically no consideration from the railroads in the point of increases in salary, promotion schedules, etc. For the same reason, also, it has been hard for engineering organizations representing them to obtain improved conditions.

It will be recalled that Engineering Council representatives went before the old Board of Wages and Working Conditions under the Railroad Administration to assist in getting a classification and increased compensation for the men who have now been classed "Engineers of Mechanics". Some good was accomplished, but conclusive results could not be obtained because this group of engineers were not then known as a unit on the railroads.

IMPORTANT FLOOD LEGISLATION

The Minnesota River and the Big Stone Lake, which are on the boundary between Minnesota and South Dakota, are proposed for flood protection in a bill which has passed the House of Representatives with practically no dissenting vote. The bill has already passed the Senate, after lengthy hearings. Important hearings were also held before the House Committee.

Minnesota flood control work has been delayed up to the present time because that State is forbidden by its Constitution to spend funds for such internal improvement. It is proposed to use the Big Stone Lake as a reservoir to hold back the flood waters, this being accomplished by the construction of a dam at the foot of the lake. The entire cost of improvement is to be borne by those benefited, according to provisions of the bill. The project has the sanction of prominent engineers and the approval of the Engineer Corps of the War Department, and will protect property worth millions of dollars.

Engineering Foundation Seeks Large Endowment

Based on the generous gifts and high purpose of Ambrose Swasey, Engineering Foundation has since 1915 maintained a liaison between engineers, as represented by the Founder and other societies, and scientific workers, as represented in National Research Council. Practical means for co-operation in research have been set up so that engineers in the numerous branches of the Profession may join with physicists, chemists, geologists, geographers, psychologists, doctors, biologists, educators and anthropologists, in the attack upon problems of common interest and in the exchange of knowledge. Potential benefits for the whole Nation are very great, but these benefits cannot be gained without expenditure of effort and materials. Research workers must be supported. Equipment, materials, working places and traveling facilities must be provided. Since the benefits accrue to the professions, the industries and the public in general, support in large measure should come from general funds, such as those provided by endowments.

Although engineers, like other professional men as a class, are not wealthy, some individual engineers have large means. Engineering Foundation seeks to build up its endowment to dimensions worthy of the Profession. Engineers connected with industrial and financial organizations having great resources can aid by convincing proper officials of corporations that the continued prosperity of our industries depends upon continued progress of research. Since the commercial and industrial establishments of the country reap the larger proportions

of the financial profits arising from scientific and technological work, these establishments should contribute liberally to the support of research.

Scientists are more largely concerned in research in pure science, the search for undiscovered knowledge for its own sake, the usefulness of which may not become apparent in some instances for many years. Between this most advanced line and the development of specific industrial devices or processes, lies the large field of research in applied science and the industries which especially concerns technologists. In this broad field there is scarcely an item of work in which the Engineer in some branch of his practice is not directly concerned. Sooner or later the Engineer uses all the results of research in science and the industries.

There are many problems relating to the materials and forces of engineering on which further knowledge is needed. Progress will be made approximately in proportion to the funds made available. But there are other kinds of problems which concern the Engineer. No longer may one declare, as did Professor J. B. Johnson, a generation ago, that "Engineering differs from all other learned professions in this, that its learning has to do only with the inanimate world, the world of dead matter and force." Many acute social and economic questions of our day need the dispassionate, impartial, patient study of scientists and technologists. To these questions must now be applied the scientific method of collecting facts by thorough study, and the engineer's capacity for planning and performing, instead of ill-considered "reforms".

Engineering works, public, corporate and private, frequently involve studies of special problems or in themselves constitute full-size experiments which could be made to yield important data for general technical use. Sometimes the engineers in charge do not perceive the opportunity, not having been trained in research work. More often the possibilities are realized, but means, men and time are not available because of the urgency for completing the project with a minimum expenditure in the shortest practicable time.

Occasionally experimental work is undertaken in accordance with a well-conceived plan as a necessary or desirable adjunct to the main operation. In such cases the exigencies of the main operation sooner or later interrupt the experimental work; or the men who have it in hand leave the force; or the information is gained, but never written up; or the statement is buried in some report of limited circulation; or greater familiarity with research methods and a broader conception of the problem could, with small additional expense, have secured much more valuable results and have made them more generally useful.

Again, many construction or manufacturing operations might be made to yield useful data of greater value than those obtained from small-scale laboratory experiments, if only trained observers with suitable instruments were provided. Often the expense would be slight. Sometimes for lack of trained observers occurrences of scientific significance pass unnoted.

The services described in the foregoing paragraphs, and many others, could be performed by Engineering Foundation if adequate funds could be placed at its disposal. The Foundation does not plan to build laboratories and conduct research work directly, but rather to stimulate, co-ordinate and support research work in existing scientific and industrial laboratories, co-operating, in so far as may prove advantageous, with the National Research Council.

Mr. Charles F. Rand, Chairman of Engineering Foundation, in collaboration with Mr. Swasey, is actively seeking additions to the endowment fund which will swell the total to at least \$1 000 000 in the near future. Mr. Swasey's gifts amount to \$300 000. The office of Engineering Foundation is in Engineering Societies Building, 29 West 39th Street, New York. Further information may be had by addressing its Chairman, who will upon request mail a booklet giving an account of the Engineering Foundation and its work.

America's Gift to France to Commemorate Battle of the Marne

At the meeting of the Board of Direction of the Society in Chicago on April 19th, 1920, an appeal for contributions to "America's Gift to France" to commemorate the Battle of the Marne was endorsed; and the following action taken:

"It was moved and carried that the endorsement of this matter by the Board be recorded, that a publication of it be made in *Proceedings*, and that the Secretary be requested to transmit to the Secretaries of the Local Sections the information contained therein, with the suggestion that it be brought up at meetings of the Local Sections for them to secure voluntary subscriptions at those meetings and transmit them, through the Secretary of the Society, to the National organization of 'America's Gift to France.'"

The following statement has been issued by the latter organization:

HISTORY OF MARNE MEMORIAL MOVEMENT

"The heroic statue now being designed by Frederick MacMonnies, which will be 'America's Gift to France', will be placed in a position overlooking the Marne River near the village of Meaux, where the first German advance on Paris was stopped on September 6th, 1914, less than thirty miles from Paris.

"The idea of a memorial gift from America, to commemorate this victory of Joffre's poilus over the enemies of civilization, originated with a group of Americans who have formed a National Committee,

with Thomas W. Lamont as chairman and Myron T. Herrick, former ambassador to France, as chairman of the Executive Committee.

"Like the Statue of Liberty, the Marne memorial will be of colossal size. According to the present plans of the sculptor, it will represent the Spirit of Liberty as a woman, struggling with undaunted courage against her enemies. This central figure will be reinforced by others representing, probably, the Allies of France, the whole group taking the form of a pyramid, which to Mr. MacMonnies signifies defensive strength.

"The Statue of Liberty was paid for by popular subscriptions, in small amounts, which poured in from every corner of France, a striking illustration of the regard in which the United States was held by the sister republic. America's Gift to France will cost \$250 000, about the same as the cost of the Statue of Liberty, and it will be paid for in the same way as France paid for her gift to this nation. Feeling that it will be more expressive of the spirit of the gift to have small contributions from all the people than large donations from a few, the National Committee for America's Gift to France designated the week of March 22d for taking a national voluntary collection, to which everybody will have an opportunity to contribute.

"The sponsors of America's Gift to France desire to make it at once a memorial to the defenders of civilization who fought at the Marne, a reciprocal gift in return for the Statue of Liberty, and a lasting expression of that feeling of kinship in democracy which unites the two great republics."

It is planned to record in "The Book of the Marne", to be placed in the statue, the names of all the towns, cities, and societies which have contributed. The coats of arms of all States that contribute will be done in bronze at the base of the monument.

Engineering Societies Employment Bureau

The following figures indicate the scope of the Engineering Societies Employment Bureau activities for the first quarter of 1920:

	January	February	March	Total
Number registered.....	210	174	309	693
Number of Members placed.....	52	46	49	147
Number of Non-members placed.....	68	31	53	152
Number of men placed (not registered)...	18	16	17	51
Number of pieces of mail sent out.....	3 389	2 420	3 562	9 371
Number of applications forwarded.....	2 552	3 288	3 570	9 410

EUROPEAN NOTES

The following notes relative to reconstruction, etc., in Belgium and France, and industrial progress, etc., in Great Britain and elsewhere, have been contributed by W. E. Woolley, Assoc. M. Am. Soc. C. E., of London, England, who is also a Corresponding Member of the Société Centrale d'Architecture de Belgique.

War Museum at Crystal Palace, London

The Imperial War Museum, according to the *Daily Chronicle*, London, will open on June 9th, 1920, and occupy the Crystal Palace, for four years, pending the provision of a permanent home. Exhibits will total more than 100 000. The whole collection will illustrate every phase of the nation's war life, at home and on the fighting fronts.

For three years, after the War Cabinet had approved the formation of the museum, a committee has been collecting material of every description. This, incidentally, is in striking contrast to the casualness of previous generations which left in London's keeping only a pair of kettle-drums as the sole souvenirs of Marlborough's campaigns, and 5 field guns and 200 cuirasses as the mementoes of Wellington's battles.

Among the things that have passed into the possession of the Museum Committee are innumerable Army reports, orders, and memoranda. Although all will not be suitable for exhibition purposes, they will be greatly prized by the historian.

Business Visitors from America

The American invasion has commenced, says the *Evening Standard*, London, but it is obvious that, so far, pleasure seekers are in a minority. Of 78 prominent American visitors now in London, only one would be described in England as "independent." Of the remainder the majority came from New York, Boston, and Philadelphia. They were in every case business men, and comprised 15 manufacturers, 12 merchants, 7 engineers, 3 theatrical producers, 4 publishers, and 5 financial magnates.

Anglo-American Library for Central Europe

Owing to the unfavorable rate of exchange and the high cost of living, prices of recent English and American books on philosophy, science and literature have made it impossible for the universities of Central Europe to keep in touch with English and American thought.

Ten shilling books, for example, cost an equivalent of more than £9 in Germany and £30 in Austria. It is proposed therefore to establish in Central Europe, under British-American auspices, one or more libraries of recent English books indispensable to university teachers.

All university teachers in the United Kingdom and America are requested to give their approval and co-operation to a plan, which already has the support of many influential educationists, by sending their names to the Secretary, Mr. B. M. Headicar, Librarian of the

London School of Economics (University of London), Clare Market, London, W.C.2, England.

Belgium Places Record Order with British Firm

A contract for the construction of 200 powerful locomotives has been recently awarded by the Belgian Government to Sir W. G. Armstrong, Whitworth and Company, Limited, of Newcastle-upon-Tyne.

It is understood to be the largest individual order for locomotives ever awarded by any railway system, or secured by any firm of locomotive builders, and represents a money value closely approximating to three millions, sterling.

A Professional Union Formed in France

According to *Le Matin*, Paris, a union of professional workers called "La Confédération des Travailleurs Intellectuels" was formed at a meeting of delegates from 200 professional associations, including those engaged in arts, letters, the liberal professions, pure and applied science, commerce and industry. Its object is to represent and defend the interests of those, both men and women, who derive their principal income not from manual labor nor interest from property, but by their intellectual work.

BRIEF NOTES

Henry J. Ford, Professor of Politics at Princeton University, and James Duncan, of Quincy, Mass., former Vice-President of the American Federation of Labor, have been nominated by President Wilson to be members of the Interstate Commerce Commission.

The National Highways Protective Society reports that 82 persons were killed by automobiles in New York State during the month of April, 1920. In New York City 50 were killed by automobiles, 6 by trolley cars and 6 by wagons.

Increases of 1800% are reported in the cost of men's clothing in France since 1914.

The National Industrial Conference Board reports that since the signing of the armistice on November 11th, 1918, the increases in the cost of clothing have almost equalled the percentage of increase during the war. The following average increases from July, 1914, to March, 1920, are given: Food, 100%; shelter, 49%; clothing, 177%; fuel, light and heat, 49%; sundries, 83%; all items, 94.8%.

Col. Paulino Fontes, Director General of National Railways of Mexico, announces that contracts have been closed in the United States

for \$1 500 000 worth of rolling stock. He says that an additional \$1 500 000 will be spent for cars and locomotives.

American newspapers may be without print paper at the end of ten years unless there is conservation of advertising space. The output of print paper is dwindling rapidly, and the outlook is that all the pulp mills of the United States and Canada will not be adequate to meet the demand, even if the supply of spruce timber holds out.

A report received from England shows that for the 6 months ended in January, 1920, commercial and pleasure airplanes made 35 330 flights for a total of 593 000 miles covered on the regular London-Paris and Channel routes, in addition to those engaged in regular flights in the United Kingdom.

R. S. McElwee, Assistant Director, Bureau of Foreign and Domestic Commerce, in addressing the Convention of the Chamber of Commerce of the United States on cartage costs as an item of marine terminal expense, placed great stress on the importance of warehousing and trucking. He stated that modern piers should be constructed, and that the problem of demountable bodies at rail and marine terminals, and store-door delivery, or zone delivery systems, is a bigger problem than individuals can solve alone.

A large volume of new railroad equipment orders was placed by different railroad companies on April 21st, 1920, and there has been a substantial increase in inquiries made by carriers for locomotives and cars. A canvass of the market shows that there are inquiries for a total of more than 1 500 locomotives. The Union Pacific System is understood to have ordered 1 000 cars from the Pullman Company and 1 000 freight cars.

As the Library of the American Society of Civil Engineers has been method in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 39 West 38th Street, New York City, who will gladly give information concerning the library for the various branches of service. A more comprehensive statement is found in this matter will be found on page 21 of the Year Book for 1920.

ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 6 P. M.

FUTURE MEETINGS

June 2d, 1920.—8.30 P. M.—This will be a regular business meeting. A paper by Charles Evan Fowler, M. Am. Soc. C. E., entitled "Revision of the Niagara Railway Arch Bridge," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

ANNUAL CONVENTION

The Fiftieth Annual Convention of the Society will be held in Portland, Ore., from August 10th to 12th, 1920, inclusive.

A circular giving full information as to the general programme, transportation, hotel rates, etc., will be issued later.

ENGINEERING SOCIETIES EMPLOYMENT BUREAU

Engineering Societies Employment Bureau, established December 1st, 1918, as an activity of Engineering Council, is managed by a board made up of the Secretaries of the four Founder Societies, funds for its maintenance being provided by these Societies. The Bureau is co-operating with engineering organizations in all parts of the country and with the Re-employment Bureau under the auspices of the American Legion. It is desirous of increasing such co-operation by working with local engineering associations and clubs. The work of the Bureau since its inception has been largely in the line of securing employment for men retiring from government war service. Members of the American Society of Civil Engineers who desire to register with this Bureau should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Employment Bureau, First Floor, Engineering Societies Building, 29 West 39th Street, New York City.

SEARCHES IN THE LIBRARY

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 21 of the Year Book for 1920.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussion, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 35 of the Year Book for 1920.

LOCAL SECTIONS OF MEMBERS

OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Section, Organized 1905.

M. M. O'Shaughnessy, President; Nathan A. Bowers, Secretary-Treasurer, 531 Rialto Building, San Francisco, Cal.

The San Francisco Section of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting of the Section.

Informal luncheons are held at noon, every Wednesday, at the Engineers' Club, where special tables are reserved for members and guests of the Section.

The by-laws of the Section provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

(Abstract of Minutes of Meetings)

January 20th, 1920.—The Special Meeting was called to order at 7.30 P. M.; Charles H. Lee in the chair; Nathan A. Bowers, Secretary; and present, also, 20 members and guests.

Chairman Lee explained the purpose of the meeting, namely, the presentation and discussion of a paper entitled "Outline and Glossary of Ground-Water Hydrology" by Oscar E. Meinzer, Chief of the Bureau of Ground Water, Water Resources Branch, U. S. Geological Survey.

Mr. Meinzer presented his paper and explained the need it was written to fill, and the subject was discussed orally by Messrs. C. E. Grunsky, A. H. Markwart, H. L. Haehl, J. D. Galloway, W. H. Kirkbride, Paul Bailey, H. D. McGlashan, W. H. Phillips, and C. H. Lee. Written discussions were submitted by Messrs. Edwin Duryea, Thomas H. Means, and Stephen C. Kieffer.

A vote of thanks was extended to Mr. Meinzer for his interesting paper.

Adjourned.

February 17th, 1920.—The meeting was called to order at the Engineers' Club; President M. M. O'Shaughnessy in the chair; Nathan A. Bowers, Secretary; and present, also, 66 members and guests.

The Secretary reported having on file copies of Engineering Council's Bill on the Registration of Engineers and Minutes of the Convention of the National Public Works Department Association in Washington, D. C., on January 13th-14th, 1920, and announced the recent decision of a conference of Member Societies of Engineering Council to approve the Joint Conference Committee plan for an all-comprehensive engineering organization. The Secretary also read in abstract communications from various sources for the information of the membership.

Mr. Jerome Newman, Chairman of the Civil Service Committee, reported co-operation with the State Civil Service Commission, and stated that the Committee was awaiting statement of further requirements from the Secretary of that Commission.

Mr. C. H. Snyder reported on the recent activity of the San Francisco Joint Council of Engineering Societies, particularly of the initiative taken in an effort to unite the engineers of the country in support of Herbert C. Hoover, M. Am. Soc. C. E., for President of the United States, stating that Council had sent out 600 letters on this subject to engineering organizations of the country.

Mr. C. E. Grunsky reported that he had called the first meeting of representatives of the California Engineering Council in Los Angeles, Cal., on February 21st, 1920.

Professor Charles D. Marx reported on the Annual Meeting of the Society and the discussion on the report of the Development Committee at that time.

President O'Shaughnessy announced the death on February 13th, 1920, of A. V. Saph, M. Am. Soc. C. E., a member of the Section, and appointed Messrs. E. L. Soule and J. B. Leonard as a committee to prepare resolutions to be sent to Mr. Saph's family.

A Publicity Committee for 1920 was announced as follows: Messrs. W. H. Popert, Chairman, A. V. Saph, Jr., F. P. Oakley, and Frank G. White.

The following Committee on Excursions was announced: Messrs. Fred Muhs, Chairman, C. H. Lee, L. R. McWethy, H. D. McGlashan, and J. M. Owens.

Mr. Ake Alin, a Swedish engineer who is studying hydro-electric developments in this country for the Swedish Government, addressed the meeting briefly.

Mr. A. M. Hunt, a Past-President of the Section, now residing in New York City, also spoke briefly.

The Secretary requested that members report to him promptly the names and addresses of new members of the Society coming to this District in order that he might extend to them an invitation to join the Section.

On motion, duly seconded, the following resolution was adopted:

"Whereas, Oscar E. Meinzer, of the U. S. Geological Survey, appeared before this Association on January 20th, 1920, and led an interesting discussion on his paper entitled "Outline and Glossary of Ground-Water Hydrology"; and

"Whereas, This paper contains many matters of great interest to engineers who have to deal with this subject; therefore be it

"Resolved, That this Association respectfully urge the publication and distribution of Mr. Meinzer's paper as a water-supply paper of the U. S. Geological Survey; and be it further

"Resolved, That a copy of these resolutions be forwarded to the Director of the U. S. Geological Survey."

President O'Shaughnessy announced that the Southern California Section had requested the Section to consider the advisability of taking action on the question of universal military training. He stated that the Southern California Section had voted unanimously to favor such training and had made recommendations in connection therewith. On motion, duly seconded, the meeting voted unanimously to go on record as favoring universal military training.

Mr. Thomas H. Means called the attention of the Section to the fact that the resignation of Mr. D. W. Ross left a vacancy on the Irrigation Board of California in which is vested important control of the building and management of irrigation districts. On motion, duly seconded, it was decided that the Section endorse the appointment of an engineer to this position and instruct the Secretary to notify the Governor of the Section's recommendations in this matter.

President O'Shaughnessy delivered the Annual Address.

The address of the evening was presented by Paul G. Redington, District Forester, U. S. Forest Service, who described briefly the methods of fire prevention, fire fighting, reforestation, the relation of forest to run-off, methods of signaling and communication, and the use of airplanes in connection with Forest Service patrol work.

Adjourned.

April 13th, 1920.—The meeting was called to order at the Engineers' Club; President M. M. O'Shaughnessy in the chair; Nathan A. Bowers, Secretary; and present, also, 130 members and guests.

The Secretary referred briefly to communications and announcements from Engineering Council, concerning matters of interest to engineers under way at Washington, D. C., and being taken up by the Founder Societies.

Reference was also made by the Secretary to discussion among the Local Sections regarding the desirability of organizing student chapters of the Society.

Letters were read from Maj. W. A. Cattell, now residing in Alhambra, Cal., and from Maj. H. L. Clark, who is stationed at the Massachusetts Institute of Technology.

The Secretary announced that tentative plans were being made for a symposium at the June meeting of the Section, during which two or three speakers are to make short addresses on the subject of "Teredoes and Salinity in the Upper San Francisco Bay and Lower Sacramento River Waters", and invited suggestions from members for carrying out the plans for the meeting.

An analysis of a statement from the National Public Works Department Association was presented, showing how California and the Western States, generally, compared with other parts of the United States in the drive for funds for that Association. California was credited with 42%, which is within six or seven of being at the top of the list.

President O'Shaughnessy introduced the following guests, each of whom addressed the meeting briefly: John C. Hoyt, Chief of the Water Resources Branch, U. S. Geological Survey, of Washington, D. C.; John L. Hall, President of the Seattle Association, and J. B. Strauss, President of the Strauss Bascule Bridge Company, of Chicago, Ill.

Mr. A. E. Cowell, Vice-President of the County Engineers' Association of California, also made a brief address.

There were also present, as dinner guests of the Section, five senior civil engineering students from the University of California and five from Stanford University, for the purpose of giving some of the students at these colleges an opportunity to meet the members of the Section and to obtain an idea of the purposes of the organization and how it functions. In response to President O'Shaughnessy's invitation, Mr. W. G. Hall spoke briefly for the Stanford men and Mr. J. G. Wright for those from the University of California.

A paper entitled "Preservative Treatment of Timber: Modern Methods, Costs, and Results" by Edmund M. Blake, Production Engineer for Charles R. McCormick and Company, was presented by the author, who illustrated his remarks with lantern slides.

Adjourned.

Colorado Section, Organized 1908.

W. C. Huntington, President; A. N. Miller, Secretary-Treasurer, 1400 West Colfax Avenue, Denver, Colo.

The meetings of the Colorado Section of Members of the American Society of Civil Engineers (Denver, Colo.) are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesday, at 12.30 p. m., at Daniels and Fisher's.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Section, Organized 1912.

V. H. Kriegshaber, President; Howard L. Stillwell, Secretary-Treasurer, 533 Trust Co. of Georgia Bldg., Care, Southeastern Underwriters' Association, Atlanta, Ga.

Informal luncheons are held for members of the Section on the last Monday of each month, at 12.30 p. m., to which visiting members of the American Society of Civil Engineers will be welcomed. The place is not fixed, but this information will be furnished on application to the Secretary.

Baltimore Section, Organized 1914.

Ezra B. Whitman, President; George F. Robertson, Secretary-Treasurer, 1628 Linden Ave., Baltimore, Md.

Cleveland Section, Organized 1914.

W. P. Brown, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

The regular meetings of the Section are held on the second Wednesday of each month, at 12.15 p. m., in the Rooms of the Electrical League, on the Fourteenth Floor of the Statler Hotel. Luncheon is served at these meetings, and visiting members are invited to attend.

Connecticut Section, Organized 1919.

Charles Rufus Harte, President; Clarence M. Blair, Secretary-Treasurer, 785 Edgewood Ave., New Haven, Conn.

The Annual Meeting of the Section is held in April. The Section also holds fortnightly meetings alternating between Hartford and New Haven, Conn. These meetings are informal luncheon gatherings held usually at noon on Saturday, a notice being mailed to each member calling attention to the date, time, place, and subject for discussion. Members are privileged to invite guests regardless of their affiliation as engineers. No set speeches are scheduled, but certain members are asked to be prepared to present the assigned subject and lead in a general discussion.

Detroit Section, Organized 1916.

Lewis M. Gram, President; Dalton R. Wells, Secretary-Treasurer, 624 McKerchey Building, Detroit, Mich.

The regular meetings of the Section are held on the second Friday of December, April, and October, the last being the Annual Meeting.

District of Columbia Section, Organized 1916.

David S. Carll, President; James H. Van Wagenen, Secretary-Treasurer, 719 Fifteenth Street, N. W., Washington, D. C.

Duluth Section, Organized 1917.

G. A. Taylor, President; Walter G. Zimmermann, Secretary, Wolvin Building, Duluth, Minn.

The regular meetings of the Section are held at noon on the third Monday of each month (usually at the Kitchi Gammi Club), with luncheon, followed by a short business session and the reading of papers. Visiting members of the American Society of Civil Engineers can secure from the Secretary definite information relative to the meetings, at which they will be welcomed. The Annual Meeting is held on the third Monday in May.

(Abstract of Minutes of Meetings)

February 16th, 1920.—The meeting was called to order at the Kitchi Gammi Club; President G. A. Taylor in the chair; O. H. Dickerson, acting as Secretary; and present, also, 16 members and 1 guest.

The minutes of the meetings of December 15th, 1919, and January 12th, 1920, were read and approved.

Communications received by the Section relative to matters of interest to the membership, were read by the Acting Secretary.

The Acting Secretary presented a communication from C. H. Snyder, Secretary of the Joint Council of Engineering Societies of San Francisco, inviting the Section to further the nomination and election of Herbert C. Hoover, M. Am. Soc. C. E., as President of the United States. On motion, duly seconded, the Secretary was instructed to reply conveying the regret of the Section at being unable to comply with the request as the Section deems it inadvisable to inject a political matter into its proceedings.

On motion, duly seconded, President Taylor was authorized to call a special meeting for the consideration of the Questionnaire on the report of the Committee on Development, such meeting to be an evening meeting.

Mr. W. H. Hoyt, the delegate of the Section to the Annual Meeting of the Society, gave a complete and interesting report of the meeting, and Mr. O. H. Dickerson also made a brief report of the same meeting.

Adjourned.

March 5th, 1920.—The Special Meeting was called to order at the Kitchi Gammi Club; President G. A. Taylor in the chair; Walter G. Zimmermann, Secretary; and present, also, 15 members.

President Taylor announced that the meeting had been called to discuss the Questionnaire on the report of the Development Committee, and suggested that each question be discussed and voted upon separately, such vote to be construed as the opinions of the members present and not binding on those voting.

On motion, duly seconded, the suggestion that discussion on Section B of the Questionnaire be taken up first, was approved.

The various questions under Section B were read, discussed, and voted upon in turn, all questions, except B-2, B-4, and B-6 receiving a unanimous affirmative vote.

On motion, duly seconded, the Secretary was instructed to notify all members of the Section not present at the meeting of the vote taken, urging them to send in their votes on the Questionnaire as soon as possible.

The Secretary read a letter from the Philadelphia Section relative to the action taken by that Section in regard to the Questionnaire.

On motion, duly seconded, a letter read by Mr. W. H. Woodbury was ordered to be sent to all members of the Society residing in District No. 7.

Mr. W. H. Hoyt read letters from various members of the Development Committee, telling of the action being taken by other Sections and members of the Society to get affirmative votes on the Questionnaire.

A letter was read from Anson Marston, Director from District No. 7, in which he called attention to the fact that he would like to receive expressions of opinion from members of the Section from time to time on matters under consideration by the Board of Direction in order that he might properly represent the membership of District No. 7 on the Board.

Adjourned.

March 22d, 1920.—The meeting was called to order at the Kitchi Gammi Club; President G. A. Taylor in the chair; Walter G. Zimmermann, Secretary; and present, also, 18 members and 1 guest.

The minutes of the meetings of February 16th and March 5th, 1920, were read and approved.

President Taylor urged all members of the Section to vote on the Questionnaire on the report of the Development Committee as soon as possible.

The Secretary presented communications received by the Section from various sources since its last meeting.

The Secretary read a letter from the Duluth Engineers' Club, enclosing a resolution adopted by that Club on March 15th, 1920, endorsing the amendment to the River and Harbor Bill before Congress relative to increase in compensation of Assistant and Junior Engineers and Chief Clerks in the Engineer Department at large. After discussion, on motion, duly seconded, the resolution was adopted as having been passed by the Section with the amendment that it be sent to such other persons as may be deemed advisable by the Secretary and that these names be added in the last paragraph of the resolution when written.

Mr. F. Hutchinson called attention to the need of proper filing space for correspondence and other papers of the Section by the Secretary, and, on motion, duly seconded, the Secretary was authorized to purchase such filing accommodations as he may deem necessary to preserve the papers of the Section properly.

Mr. H. C. Ash stated that he had been appointed by the Duluth Engineers' Club to provide for the meeting of the Club on April 19th, 1920, the entertainment of which is to be turned over to the Duluth Civil Engineers. After discussion of the subject, the Chairman was authorized, on motion, duly seconded, to appoint a committee of two to co-operate with Mr. Ash in arranging the desired entertainment. Messrs. Clark and Stark were subsequently appointed as such Committee.

The remainder of the meeting was devoted to an interesting discussion of the paper presented by Mr. Ash at the December meeting of the Section, entitled "Suburban Transportation System for the City of Duluth."

Adjourned.

Illinois Section, Organized 1916.

A. F. Reichmann, President; W. D. Gerber, Secretary-Treasurer, 913 Chamber of Commerce, Chicago, Ill.

The regular meetings of the Section are held on the second Monday of March, June, September, and December, the last being the Annual Meeting. The hour and place of meetings are not fixed, but this information will be furnished on application to the Secretary.

Iowa Section, Organized 1920.

J. E. Van Liew, President; R. W. Crum, Secretary, Iowa State College, Ames, Iowa.

Louisiana Section, Organized 1914.

A. T. Dusenbury, President; Eugene F. Deléry, Secretary, 602 Sewerage and Water Board Building, New Orleans, La.

The regular meetings of the Section are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

(Abstract of Minutes of Meeting)

April 5th, 1920.—The Annual Meeting was called to order; President Dusenbury in the chair; Eugene F. Deléry, Secretary.

On motion, duly seconded, the Secretary was instructed to inform the members of the Section that it is the sense of the meeting that the Nolan Bill, H. R. 11984, should be passed, and to request them to urge this measure on their Senators.

On motion, duly seconded, the Secretary was instructed to notify the Society that it is the sense of this meeting that the proposed amendment to the Constitution of the Society to provide Student Chapters in the recognized engineering colleges, is a good move and should be encouraged.

On motion, duly seconded, all the officers elected at the meeting of the Section on February 9th, 1920, were confirmed, except Mr. A. M. Shaw as Second Vice-President. Mr. Shaw as a Past-President is a member of the Board of Direction, and, therefore, Mr. Donald Derickson was elected as Second Vice-President in his place, the officers of the Section as at present constituted being A. T. Dusenbury, Presi-

dent; Ole K. Olsen, First Vice-President; Donald Derickson, Second Vice-President; E. F. Deléry, Secretary; and Messrs. A. M. Shaw and Arsène Perrilliat, Past-Presidents.

Adjourned.

Nebraska Section, Organized 1917.

Clark E. Mickey, President; Homer V. Knouse, Secretary-Treasurer, 200 City Hall, Omaha, Nebr.

Regular meetings of the Section are held on the first Saturday of each month, except July and August, and at such places as may be appointed from time to time by the Executive Committee. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January.

Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

New York Section, Organized 1920.

Robert Ridgway, President; Lewis D. Rights, Secretary, 256 Broadway, New York City.

The Annual Meeting is held in May. The times and places of other meetings are not fixed, but this information will be furnished on application to the Secretary.

Northwestern Section, Organized 1914.

Ralph D. Thomas, President; W. N. Jones, Secretary, City Engineer's Office, City Hall, Minneapolis, Minn.

The meetings of the Section are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month. Information as to the time and place of such meetings will be furnished on application to the Secretary.

Philadelphia Section, Organized 1913.

S. M. Swaab, President; Henry T. Shelley, Secretary, 416 City Hall, Philadelphia, Pa.

The regular meetings of the Section are held at the Engineers' Club of Philadelphia, 1317 Spruce Street, on the first Monday in January, April, and October, the last being the Annual Meeting. Special meetings are also held, in order to provide an opportunity for members to take a more active part in the work of the Section.

Pittsburgh Section, Organized 1917.

Morris Knowles, President; Nathan Schein, Secretary-Treasurer, 426 City-County Building, Pittsburgh, Pa.

The Annual Meeting of the Section is held on the first Monday in October. The time and place of other meetings are not fixed, but this information will be furnished on application to the Secretary.

(Abstract of Minutes of Meeting)

April 5th, 1920.—The meeting was called to order at the Hotel Chatham, at 8 P. M.; President Morris Knowles in the chair; Nathan Schein, Secretary; and present, also, 22 members.

The minutes of the previous meeting were read and approved. The Secretary announced the object of this meeting, namely, to receive, consider, and take action on the report of the Committee on Affiliations, which includes a proposed form for local organizations.

Communications received by the Section since its last meeting were read by the Secretary.

Mr. John N. Chester, Chairman of the Committee appointed for the purpose of arousing interest and impressing on the membership of the Society in the Pittsburgh District the importance of voting on the Questionnaire on the report of the Development Committee, reported for that Committee, stating that more than 40% of the membership of the District had already voted on these questions. On motion, duly seconded, the report was accepted and ordered to be filed.

The Secretary read a circular letter from the St. Louis Section relative to the report of the Development Committee, and, on motion, duly seconded, he was instructed to draw up a similar letter to be distributed to members of the Society in the Pittsburgh District.

A communication relative to an amendment to the Constitution of the Society providing for student chapters in recognized engineering schools throughout the country, was read, and, on motion, duly seconded, was referred to the Local Committee on Affiliations.

A discussion relative to the entertainment features of the Section followed, and, on motion, duly seconded, the Secretary was instructed to take up this matter with the Activities Committee.

Mr. Richard Khuen, Jr., Chairman of the Committee on Society Affiliations, reported on the work of that Committee, submitting a scheme of proposed regulations of the Associated Engineering Societies of Pittsburgh, to be composed of the Engineering Society of Western Pennsylvania, members of the Pittsburgh Associations of Civil Engineers, Chemical Engineers, Electrical Engineers, Mining and Metallurgical Engineers, and the American Chemical Society. On motion, duly seconded, this proposed draft was approved, subject to the right to insist on the same being referred back to the Section's Committee if modified by action of the other Societies involved.

On motion, duly seconded, the last four words of Article 7, Revisions, Section 1, "These regulations may be amended by the Council subject to approval of a majority vote of the Section at a subsequent meeting", were eliminated.

President Knowles called the attention of the Section to the Jones-Reavis Bill to create a Department of Public Works, and urged that influence be brought to bear on members of Congress to insure its adoption.

On motion, duly seconded, the Secretary was instructed to communicate with both Senators from Pennsylvania in favor of the patent legislation known as the Nolan Bill H. R. 11984, now before the Senate.

Adjourned.

Portland (Ore.) Section, Organized 1913.

J. C. Stevens, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

The Annual Meeting of the Section is held on the second Friday in January. Other meetings are called by the President and are usually convened on Friday evenings. The place is not fixed, but this information may be obtained on application to the Secretary. All members of the American Society of Civil Engineers are cordially invited to attend the meetings.

(Abstract of Minutes of Meetings)

March 8th, 1920.—The meeting of the Board of Direction was called to order at the University Club, at 12.15 P. M.; President Stevens in the chair; C. P. Keyser, Secretary; and present, also, 3 members and 1 guest.

The President suggested a programme for the Section by which an evening would be devoted to the consideration of Industrial Sites, the Drainage Channel of Columbia Slough, and the Diking Project above the Drainage Channel Project, all to be considered in relation to each other.

President Stevens announced the appointment of Mr. R. G. Dieck as the representative of the Section on the Industrial Disputes Commission which has been instituted by the Rotary Club.

The President advised that Mr. George C. Mason had found it impossible to serve as Chairman of the Legislative Committee, and, on motion, duly seconded, it was decided to appoint First Vice-President M. E. Reed, as Chairman, with Messrs. R. A. Klein and B. S. Morrow as his associates.

The Secretary was instructed to send out a circular letter to all members of the Society in Oregon, urging them to vote on the Questionnaire on the report of the Committee on Development.

Adjourned.

March 16th, 1920.—The special meeting of the Board of Direction was called to order at the University Club, at 12.15 P. M.; President Stevens in the chair; C. P. Keyser, Secretary; and present, also, 4 members.

The meeting was called to take action on a bill now before Congress, which contains a provision to increase the pay of civilian engineers and chief clerks in River and Harbor Work and provide a schedule of pensions.

On motion, duly seconded, a telegram was drafted and sent by night letter to all Oregon representatives in Congress urging them to support the bill.

The Secretary reported progress in the Questionnaire vote campaign, and it was decided to check up the replies and make a second appeal at the next meeting.

Adjourned.

March 22d, 1920.—The meeting of the Board of Direction was called to order at the University Club, at 12.15 P. M.; President Stevens in the chair; C. P. Keyser, Secretary; and present, also, 3 members and 1 guest.

The minutes of the meeting of March 16th, 1920, were read.

The Secretary reported progress in the Questionnaire vote campaign.

The Secretary reported that he had been advised by the Secretary *pro tem.* that the Oregon Technical Council was ready to receive permanent delegates. On motion, duly seconded, Messrs. J. C. Stevens and D. C. Henny were appointed to represent the Section on the Council, with the privilege of naming their alternates.

Adjourned.

April 12th, 1920.—The meeting of the Board of Direction was called to order at the University Club, at 12.15 p. m.; President Stevens in the chair; C. P. Keyser, Secretary; and present, also, 3 members and 1 guest.

Mr. D. C. Henny reported that he had appointed Mr. George C. Mason as his alternate on the Oregon Technical Council. As now constituted, the representatives of the Section in the Council are Messrs. J. C. Stevens, with F. M. Randlett as alternate, and D. C. Henny, with George C. Mason as alternate.

The Secretary reported on replies from Senators and Representatives of Oregon on the question of raise in pay and pensions for civilian engineers on United States River and Harbor Work, indicating that all of them favored the bill.

The matter of scheduled meetings of the Section in place of the occasional meetings called by the President, was discussed briefly, and, on motion, duly seconded, it was decided to try stated meetings until summer.

The following schedule for such meetings was announced by President Stevens: On April 16th, 1920, City Engineer Olaf Laurgaard will address the meeting on the "Columbia Slough Drainage and the West Side Willamette Water Front Development"; on May 14th, 1920, Mr. D. D. Clarke will deliver a lantern lecture on "Bull Run Water for Portland"; and on June 11th, 1920, there will be a discussion of "Portland's Port Schemes, Particularly Swan Island".

Adjourned.

April 16th, 1920.—The meeting of the Section was called to order at the University Club, at 8 p. m.; President Stevens in the chair; O. E. Stanley, Secretary *pro tem.*; and present, also, 15 members and 2 guests.

The minutes of the meeting of March 1st, 1920, were read and approved. The minutes of the meetings of the Board of Direction of March 8th, March 16th, March 22d, and April 12th, 1920, were also read.

President Stevens reported that on personal investigation he had found the appointment of a committee to investigate the charges against a member of the Engineering Faculty of the Oregon Agricultural College to be unnecessary, and, on motion, duly seconded, his report was accepted in lieu of the appointment of such committee.

President Stevens reported on the work of getting out the vote of the Oregon members of the Society on the Questionnaire on the report of the Development Committee.

Mr. Olaf Laurgaard addressed the meeting on the work of the City Engineer's office in connection with the Columbia Slough Drainage Channel, and the subject was discussed by Mr. W. G. Brown.

Adjourned.

St. Louis Section, Organized 1888 (Constitution Approved by Board, 1914).

Edward E. Wall, President; C. W. S. Sammelman, Secretary-Treasurer, 300 City Hall, St. Louis, Mo.

The Annual Meeting of the Section, for the election of officers and for the transaction of business, is held on the fourth Monday in November. Two meetings each year, for the presentation and discussion of technical papers, are held in the Auditorium of the Engineers' Club of St. Louis and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

San Diego Section, Organized 1915.

W. C. Earle, President; R. C. Wueste, Secretary-Treasurer, Bonita, Cal.

Seattle Section, Organized 1913.

John L. Hall, President; Bertram D. Dean, Secretary, 1711 Ravenna Boulevard, Seattle, Wash.

The regular meetings of the Section, with luncheon, are held at the Engineers' Club, Arctic Building, Third Avenue and Cherry Street, at 12.15 P. M., on the last Monday of each month. Informal luncheons are also held at 12.15 P. M., every Monday at the Engineers' Club.

Special evening meetings are held from time to time for the purpose of discussing important topics, and information concerning these meetings may be had by addressing the Secretary. All members in any grade of the American Society of Civil Engineers are cordially invited to attend the meetings when in the vicinity, and, if located in this District for any length of time, their membership in the Section will be appreciated.

(Abstract of Minutes of Meeting)

March 29th, 1920.—The meeting was called to order at 12.45 P. M., at the Masonic Club; Vice-President Carl H. Reeves in the chair; Bertram D. Dean, Secretary; and present, also, 21 members and guests.

The minutes of the meeting of March 2d, 1920, were read and approved, with the addition of Mr. Ernest B. Hussey to the Committee appointed to interview the Mayor of Seattle, Maj. Hugh Caldwell, relative to the appointment of engineers to vacancies on the Board of Public Works and the error in substituting the name of Mr. Chauncey Wernicke on the same Committee instead of Mr. J. B. Warrack.

On motion, duly seconded, the resignations of Messrs. Phil A. Franklin, K. B. Kumpe, and W. E. Herring as members of the Section, on account of removal to other States, were accepted.

On motion, duly seconded, the Secretary was instructed to pay the current bills as presented.

Mr. E. E. Adams suggested that when local members hear of members of the Society being in town they notify the Secretary of the fact in order that he may invite such visitors to attend the regular monthly luncheons of the Section.

Mr. T. E. Phipps reported on the activities of the Committee appointed to wait on Mayor Caldwell and stated that since the Committee's interview with the Mayor, Vice-President Reeves had been appointed Superintendent of Public Utilities, the first, and so far the only, appointment made on the Board of Public Works.

On motion, duly seconded, it was decided that the Committee continue its activities and that it be granted power to act officially for the Section in advising on future appointments if so requested by the Mayor.

Adjourned.

Southern California Section, Organized 1914.

W. K. Barnard, President; Floyd G. Dessery, Secretary, 619 Central Building, Los Angeles, Cal.

The Southern California Section of Members of the American Society of Civil Engineers (Los Angeles, Cal.) holds regular monthly meetings on the second Wednesday of each month, the December meeting being the Annual Meeting.

Informal luncheons in connection with the Joint Technical Societies of Los Angeles are held at 12.15 P. M., every Thursday at the Broadway Department Store Café.

The by-laws of the Section provide for the extension of hospitality to any member of the Society who may be temporarily in Los Angeles, and any such member will be gladly welcomed as a guest at any of the meetings or luncheons.

(Abstract of Minutes of Meeting)

April 2d, 1920.—The special meeting was called to order at 7.45 P. M., at the Jonathan Club; President W. K. Barnard in the chair; F. G. Dessery, Secretary; and present, also, 26 members and 10 guests.

President Barnard introduced the following guests: Dr. Elwood Mead, of Berkeley, Cal., who addressed the meeting on "Engineering and Water Conditions in California", with special reference to existing legislation in relation to water and water laws; Mr. A. J. McCune, State Engineer of Colorado, who spoke at length on "Colorado River Conditions and the Development of the Resources of This River and Its Tributaries"; Mr. I. Meeker, Special Deputy State Engineer of Colorado, whose address was on "Interstate Water Problems and Laws Relating Thereto"; and Mr. John T. Whistler, Engineer of Irrigation and Drainage, Federal Farm Loan Bureau of Denver, Colo., who spoke on the "Colorado River Basin", giving detailed description of the investigation made by the Reclamation Service.

The Secretary read a telegram from Arthur P. Davis, President of the Society, regarding amendments to the Constitution of the Society

and the 1920 Convention. After discussion of the subjects, on motion, duly seconded, the following resolution was adopted:

"Resolved, That it be the sense of the meeting that the Southern California Section of Members of the American Society of Civil Engineers convey to Mr. Hawgood, member of the Board of Direction for District No. 11,

"That, as the Board of Direction had for sound reasons decided that the Annual Convention should be held in Houston, Texas, it is the opinion of the Section that whenever the Annual Convention is held in District No. 11, it should be held in Houston,

"That, apart from all other reasons, the short time available prior to August, would prove a serious handicap against the proper and suitable arrangements for a Convention in Los Angeles at that time,

"And That, it is our opinion that the Board of Direction should now, under the circumstances developed, decide to hold the Annual Convention at some desirable place outside of District No. 11."

A letter from Mr. C. T. Leeds was read, requesting urgent action on the proposed increase of pay of civilian engineers and clerks in the U. S. Engineer Department, and, on motion, duly seconded, the Secretary was instructed to send a telegram to Senator Jones, Chairman of the Senate Committee on Commerce, urging fair action on the matter as a step in the right direction although the Association deemed the proposed 25% increase to be inadequate.

A paper by Oscar E. Meinzer, Chief of the Underground Water Division, Water Resources Branch of the U. S. Geological Survey, entitled "Ground-Water Hydrology", was presented by the author, and the subject was discussed by Messrs. Barnard, Adams, Sonderegger, Tait, Rockhold, Sawyer, Morris, and Dennis.

At the request of Acting Secretary H. S. Crocker, President Barnard appointed Mr. William Mulholland to prepare a memoir of the late A. C. Hansen, M. Am. Soc. C. E., for publication by the Society.

A letter from the Duluth Section, regarding the Alvord Committee report, was read and ordered to be filed.

Mr. George G. Anderson reported on the meeting of the Joint Conference Committee, held in Philadelphia, Pa., in March, 1920, and urged a full vote of the membership on the Questionnaire on the report of the Development Committee.

Mr. Anderson also discussed a letter from the St. Louis Section relative to the necessity of engineers becoming more closely affiliated with the public, etc.

A rising vote of thanks was extended to Mr. Meinzer for his valuable paper.

Adjourned.

Spokane Section, Organized 1914.

Alfred D. Butler, President; Charles E. Davis, Secretary-Treasurer, 401 City Hall, Spokane, Wash.

The regular meetings of the Section are held on the second Friday of each month, except July and August. The hour and place of

meeting are not fixed, but this information will be furnished on application to the Secretary.

Visiting members are invited to attend the meetings.

Texas Section, Organized 1913.

Hans Helland, President; E. N. Noyes, Secretary, Deere Building, Dallas, Tex.

Utah Section, Organized 1916.

A. B. Villadsen, President, 304 Dooly Bldg., Salt Lake City, Utah.
The Annual Meeting of the Section is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the President.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcome in the Reading Rooms and at the meetings of many engineering societies in all parts of the world. A list of such societies will be found on pages 42 and 43 of the Year Book of the Society for 1920.

Upon request by its Board of Trustees, the Engineering Societies of Wisconsin, Madison, Wis., is to be added to the above mentioned list, and its members are accorded the usual courtesies and privileges of the Headquarters of the Society.

NEW BOOKS*

(From April 1st to April 30th, 1920)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

DONATIONS TO ENGINEERING SOCIETIES LIBRARY**TRANSIENT ELECTRIC PHENOMENA AND OSCILLATIONS.**

Theory and Calculation of. By Charles Proteus Steinmetz. Third Edition, Rev. and Enl. N. Y. and Lond., McGraw-Hill Book Company, Inc., 1920. 696 pp., 9 x 6 in., cloth. \$6.00.

This volume, which is to some extent a continuation of the author's "Theory and Calculation of Alternating-Current Phenomena", deals with the transient phenomena of the readjustment of stored electrical energy which is necessitated by a change in circuit conditions. The present edition has undergone extensive revision and expansion, and has practically been rewritten. A new section, entitled "Variation of Circuit Constants", has been added, and the method of symbolic representation has been changed from the time diagram to the crank diagram.

THE ALDRICH MARINE DIRECTORY.

N. Y., Aldrich Publishing Co., 1920. 246 pp., 8 x 4 in., flexible cloth. \$5.00.

The third edition of this useful directory contains a list of concerns which build and repair vessels in the United States, and also of steamship, steamboat, and other vessel owners operating ships under the American flag. The lists are divided geographically, the main sections covering the Atlantic Coast, the Pacific Coast, the Great Lakes, and the Mississippi Valley. The shipbuilders' list comprises more than 400 shipbuilding or repair yards and about 400 dry docks and marine railways. Particulars of Government owned or controlled ships are not included. The volume is thoroughly indexed.

ELEMENTS OF STEAM AND GAS POWER ENGINEERING.

By Andrey A. Potter and James P. Calderwood. N. Y. and Lond., McGraw-Hill Book Company, 1920. 297 pp., illus., 8 x 5 in., cloth. \$2.50.

The object of this treatise is to provide a clear, concrete statement of the principles underlying the construction and operation of steam and gas power equipment, suited to familiarize students of engineering with power plant equipment before they take up the study of thermodynamics and design, and to those responsible for the operation of power plants.

AIRCRAFT YEAR BOOK:

Issued by Manufacturers Aircraft Association, Inc., 1920. N. Y., Doubleday, Page and Company. 333 pp., illus., 9 x 6 in., cloth. \$2.00.

The first issue of this annual review of the industry appeared in 1919. The present issue, the second of the series, reviews the progress to date in various fields of aeronautical activity. Aircraft in commerce and in warfare, technical developments between 1914 and 1919, and cross-country flying are discussed, and a detailed story of the recent achievements of the firms composing the Association is given. The book also contains the text of the convention relating to international air navigation, the report of the American Aviation Commission, a chronology of the events of 1919, and appendixes giving information on Governmental activities.

*Unless otherwise specified, books in this list have been donated by the publishers.

HANDBOOK OF ORE DRESSING:

Equipment and Practice. By A. W. Allen. N. Y. and Lond., McGraw-Hill Book Co., 1920. 240 pp., illus., tab., 7 x 5 in., flexible cloth. \$3.00.

This is an attempt to supply a handy, practical handbook for millmen and engineers, which will cover the various stages in the mechanical handling and preparation of an ore for metallurgical treatment. The volume includes a brief bibliography and is of a convenient size for the pocket.

GEOLOGY OF THE MID-CONTINENT OILFIELDS.

By T. O. Bosworth. N. Y., The McMillan Co., 1920. 314 pp., illus., plates, charts, maps, 9 x 6 in., cloth. \$3.00.

The present interest in the search for oil makes this book on the greatest of the world's developed oil territories particularly timely. The fields included in this region have not heretofore been regularly grouped together as a whole in oil literature, but have been scattered under different titles according to location. The author has endeavored to deal with the Mid-Continent Oil Region as a well-defined unit with a natural geological boundary, and to that end has set forth and reviewed the facts which he has drawn from many sources, especially the United States and the State Geological Surveys. Contents: Introduction and Bibliography; Geographical and Geological Situation of the Mid-Continent Oil Region; History of the Development of the Mid-Continent Oil Region; Geological Structure of the Mid-Continent Oilfield Region; Geological History of the Oil Bearing Deposits; Stratigraphy and the Oilfields; The Oil Accumulations and Their Relation to Geological Structure; Character of the Oil; The Natural Gas; Production of Gasoline from Natural Gas; Salinity of Oilfield Waters; Some General Conclusions.

PROSPECTOR'S FIELD-BOOK AND GUIDE

In the Search for and the Easy Determination of Ores and Other Useful Minerals. By H. S. Osborn. Ninth Edition Thoroughly Rev. and Enl., by M. W. von Bernewitz. N. Y., Henry Carey Baird & Co., Inc., 1920. 364 pp., illus., tab., 7 x 5 in., flexible cloth. \$3.00.

Since 1910, when the Eighth Edition of the Guide was published, conditions and methods in the mining field have changed, necessitating the addition of much new material in order to bring the work up to date. Lists of suitable outfits, new field tests, notes on sampling, an explanation of the unit system of selling ores, and an entirely new chapter on the alloy minerals are included in this revision, and the principal characteristics of certain ore deposits in various parts of the world are discussed. The book also contains a glossary of mining and mineralogical terms and an appendix of useful tables.

OPPORTUNITIES IN ENGINEERING.

By Charles M. Horton. N. Y. and Lond., Harper and Brothers. 90 pp., 8 x 5 in., paper. \$1.00.

The tremendous power which engineers wield in world affairs has inspired the author to set forth in this book the opportunities for constructive work which lie before the man who selects engineering as his profession. He also describes the type which, being best fitted for the work, is most likely to succeed, and gives some hints for the guidance of the student who is choosing his vocation, as well as some examples of what has been done by those already in the work.

HOW TO MAKE AND USE GRAPHIC CHARTS.

By Allan C. Haskell. With an Introduction by Richard T. Dana. N. Y., Codex Book Co., 1919. 540 pp., diagrams, 6 x 9 in., cloth. \$5.00.

The object of this book is to call attention to the many functions which graphic methods can accomplish and to indicate the suitability of the various methods of charting for various purposes. After describing the theory and construction of the various types of charts, the author gives many examples of charts used to aid in organization and management, in analyzing costs and operating characteristics, in recording tests, in predicting trends and tendencies, in computing, designing, and estimating. Bibliographies are given with many of the chapters.

ECONOMIC DEMOCRACY.

By C. H. Douglas. N. Y., Harcourt, Brace and Howe, 1920. 140 pp., 5 x 8 in., cloth. \$1.60.

This book, based on the cost investigations of the author while Assistant Superintendent of the Royal Aircraft Factory of England, and written for the most part under the pressure of war conditions, is an attempt to disentangle from a mass of superficial features, such as profiteering and alleged scarcity of commodities, a sufficient portion of the skeleton of the structure we call Society as will serve to suggest sound reasons for the decay with which it is now attacked, and afterward to indicate the probable direction of sound and vital reconstruction. Democracy, the author believes, is not so much a matter of elective administration as of distributed economic power, the attainment of which is a question of the establishment of the just price and the control of the policy of industry through the mechanism of the credit system.

RETAINING WALLS: THEIR DESIGN AND CONSTRUCTION.

By George Paaswell. N. Y. and Lond., McGraw-Hill Book Co., 1920. 275 pp., diagrams, illus., 9 x 6 in., cloth. \$4.00.

This work differs from the usual treatise on the subject by being essentially a text on the design and construction of retaining walls, rather than an analytic study of the action of the retained earth masses. The failures of walls are usually not due, in the author's opinion, to weaknesses in the theory of pressures, but to faulty design and construction, and it is to these questions he directs his attention.

COURS DE MÉCANIQUE RATIONNELLE.

Avec de Nombreuses Applications à l'Usage des Ingénieurs—Cinématique—Statique—Dynamique. By L. Legrand. Paris and Liège, Ch. Béranger, 1920. 618 pp., illus., 10 x 6 in., cloth. 48 francs.

The author of this textbook believes that there is need for a work which will present the subject in a strictly scientific manner, but which will draw its illustrations from the realm of industrial mechanics, rather than from celestial mechanics, as is usually done in theoretical treatises, and presents the book for this purpose. He has attempted to supply a complete course in which an engineer will find the theory illustrated by problems which arise in the practice of applied mechanics in various industries.

DONATIONS TO THE READING ROOM**FAIR VALUE:**

The Meaning and Application of the Term "Fair Value" as Used by Utility Commissions. By Harleigh H. Hartman. Bost. and N. Y., Houghton Mifflin Company, 1920. 19 + 263 pp., 8 x 5 in., cloth. \$2.50.

This book was awarded the 1918 Hart, Schaffner and Marx Prize offered for studies on economic and commercial subjects. In it, the author, it is stated, presents the theory of fair value, the laws interpreting that theory, and its application in practice. He has divided the subject-matter into two parts, in the first of which he considers the problem of public utility regulation, its aims and needs, the development of the valuation theory, valuation methods, their advantages and disadvantages, etc. In the second part, he applies the general principles, as formulated in Part I, to existing practice in commission valuation cases, etc. At the end of each chapter a summary of the ideas set forth in that chapter is given, and a selected bibliography of the subject is also included, as well as a table of cases cited in the text. The Contents are: Part I, The Meaning of the Term "Fair Value"; Purpose of Regulation; Valuation and Regulation; The Theory of Valuation; Valuation Methods. Part II, The Application of the Theory of Fair Value: The Valuation of Tangible Property; Valuation of Intangible Property; Depreciation; The Return on the Investment; Conclusion; Index.

MEMBERSHIP

(From April 6th to May 1st, 1920)

ADDITIONS

	MEMBERS	Date of Membership.
ADLER, JULIUS.	Technical Engr., The Atlantic Refining Co., 1211 Chestnut St., Philadelphia, Pa.....	Mar. 9, 1920
BLAND, MILES CARLISLE.	Engr., Erecting Dept., Bethlehem Steel Bridge Corporation, } Steelton (Res., 1005 North 2d St., Har- } risburg), Pa.....	Assoc. M. Sept. 3, 1902 M. April 21, 1920
CHAMBERLIN, WILLIAM DANIEL.	Prin. Asst. Engr., The United Railroads of San Francisco, 1434 Seventh Ave., San Francisco, Cal.....	Mar. 9, 1920
CRUM, ROY WINCHESTER.	Engr. of Materials and Tests, Iowa State Highway Comm., } Ames, Iowa.....	Assoc. M. Dec. 31, 1913 M. Mar. 9, 1920
ELLIS, THEODORE HORATIO.	Cons. Engr., Fuel Oil Stations, U. S. Shipping Board, 610 Springfield Ave., Sum- mit, N. J.....	April 19, 1920
FLYNN, HARRY FRANKLIN.	U. S. Asst. Engr., } 815 Witherspoon Bldg., Philadelphia, Pa. }	Assoc. M. Dec. 6, 1915 M. April 21, 1920
HIBBARD, MERRILL.	Mgr.-Engr., Jeffrey Mfg. Co., 175 East Frambes Ave., Columbus, Ohio.....	Mar. 9, 1920
JARVIS, CLARENCE SYLVESTER.	Capt., Engrs., } U. S. A., Benicia Arsenal, Benicia, Cal. }	Jun. Sept. 4, 1906 Assoc. M. Sept. 5, 1911 M. Jan. 20, 1920
MCVEA, JOHN CRANE.	City Engr., City Hall, Houston, Tex.....	Assoc. M. Nov. 28, 1916 M. April 21, 1920
MASHBURN, LEON WADDELL.	Clarksdale, Miss. }	Assoc. M. May 6, 1914 M. April 21, 1920
MYRON, JOHN PATRICK.	Secy. and Gen. Mgr., Pittsburgh Filter & Eng. Co., Pittsburgh (Res. 707 North St., Oil City), Pa.....	April 19, 1920
NABSTEDT, HARRY MARTIN.	Western Mgr., Ambursen Constr. Co., Inc., 2516 Forest Ave., Apartment 5, Kansas City, Mo.....	Mar. 19, 1920
NEWTON, GEORGE CHENEY.	Vice-Pres., Newton Co., Secy. and Asst. Gen. Mgr., De Pere- Burton Co., 185 Mason St., Milwaukee, Wis.....	Jun. Feb. 4, 1908 Assoc. M. Mar. 5, 1912 M. April 21, 1920
PENNELL, JAMES ROY.	State Highway Engr., } Columbia, S. C.....	Assoc. M. Oct. 10, 1916 M. April 21, 1920
ROGERS, AUGUSTUS.	1155 Park Ave., New York City.....	April 19, 1920
SHERRILL, CLARENCE OSBORNE.	In Chg., Military Constr. Div., Office, Chf. of Engrs., Washington, D. C.....	Mar. 9, 1920

MEMBERS (Continued)		Date of Membership.
SNEAD, CHARLES DABNEY. Bridge Engr., Dept. of Public Roads, Frankfort, Ky.....		April 19, 1920
VERNON, STEPHEN BARKER. Asst. Supt. and Treas., Delaware Seamless Tube Co., Auburn, Pa.....	} Assoc. M. M.	Jan. 4, 1910 April 21, 1920
WALTER, ROSCOE GEORGE. Asst. Gen. Supt., Wisconsin Power, Light & Heat Co., Madison, Wis.....		Sept. 3, 1913 April 21, 1920
WEBBER, ROY IRVIN. Supt. of Grounds and Bldgs., The Pennsylvania State Coll., State College, Pa.....	} Assoc. M. M.	April 1, 1908 April 21, 1920
WHITE, FRED RAY. Chf. Engr., Iowa State Highway Comm., Ames, Iowa.....		April 19, 1920
WHITING, GEORGE WILLIAM CARLYLE. Pres., The Whiting-Turner Constr. Co., Stewart Bldg., Baltimore, Md.....	} Jun. Assoc. M. M.	Sept. 5, 1905 Nov. 8, 1909 April 21, 1920
YARNELL, DAVID LEROY. Senior Drainage Engr., Bureau of Public Roads, U. S. Dept. of Agriculture, Washington, D. C.		Jun. April 5, 1910 Assoc. M. Oct. 1, 1912 M. April 21, 1920

ASSOCIATE MEMBERS

ALLARDICE, JAMES PROCTOR. Prin. Asst. Engr., City of Fall River, Board of Assessors, 21 Forest St., Fall River, Mass.		April 19, 1920
ALLTON, ROBERT ADAMS. Prin. Asst. Engr., Pearse & Greeley, Chicago (Res., 319 Dempster St., Evanston), Ill.		April 19, 1920
ATKINSON, GUY. Asst. to the Director, The Emerson Engrs., 30 Church St., New York City.....	} Jun. Assoc. M.	June 23, 1916 April 19, 1920
AUSTIN, WILLIAM MILNES. Waynesboro, Va.....		April 19, 1920
BARRY, JOHN GORDON. 1411 McCulloch St., Wheeling, W. Va.....		April 19, 1920
BECKER, CHARLES WALTER. Engr. of Constr., Stephen Sanford & Sons, Inc., 25 Clinton St., Amsterdam, N. Y.		April 19, 1920
BECKETT, GARNER ARTHUR. Field Engr., Portland Cement Assoc., 2256 Central Ave., Alameda, Cal.....		Nov. 25, 1919
BECKMAN, HENRY CLAUS. 609 Liberty St., Muscatine, Iowa.....		Mar. 9, 1920
BLOMGREN, WALTER EDWARD. Asst. Engr., U. S. Reclamation Service, Shoshone Project, Deaver, Wyo.		April 19, 1920
BROWN, JOSEPH OAKLEY. Chf. Engr. and Gen. Supt. of Constr., Adams, Evans & Co., 393 East 18th St., Brooklyn, N. Y.....		April 19, 1920
BUTTS, WENDELL MORRIS. 964 Euclid Ave., Berkeley, Cal.		Oct. 14, 1919

ASSOCIATE MEMBERS (Continued)		Date of Membership.	
CAMPBELL, JOHN TITREVILLE. Chf. Draftsman and Asst. Engr., Chester & Fleming, 1111 Union Bank Bldg., Pittsburgh, Pa.....			Mar. 9, 1920
CLARK, CHARLES ARMSTRONG. Dist. Engr., Portland Cement Assoc., 909 Southwestern Life Bldg., Dallas, Tex.....	Jun. Assoc. M.	Nov. 26, 1918 April 19, 1920	
COFFEY, WALTER MARION. Rio Vista, Cal.....		Nov. 25, 1919	
COLÁS, NICHOLAS. Civ. Engr., The Spanish Am. Iron Co., Felton, Oriente, Cuba...	Jun. Assoc. M.	Oct. 1, 1913 Jan. 19, 1920	
COLE, HARRY WALDO. Borough Engr., Farrell and Wheatland, City Bldg., Farrell, Pa..	Jun. Assoc. M.	Aug. 31, 1915 April 19, 1920	
COLLINS, ARTHUR BURE. Asst. Drainage Engr., Yakima County, 105 North 7th St., Yakima, Wash.....		Nov. 25, 1919	
EDWARDS, GILES HAMILTON. Lancaster, Tex.....		April 19, 1920	
FISHER, LEWIS NEBINGER. (L. N. Cope & Son), 1177 West Forest Ave., Decatur, Ill.....		April 19, 1920	
FRIEND, HENRY LOUIS. Asst. Div. Engr., Miami Conservancy Dist., Taylorsville Dam, Vandalia, Ohio.....		April 19, 1920	
GARDNER, GEORGE WASHINGTON. Borough Engr., Madison, Kings Rd., Box 92, Madison, N. J.....	Jun. Assoc. M.	Jan. 15, 1917 April 19, 1920	
GEIST, ALEXANDER. Chf. Draftsman, Submarine Boat Corporation, 172 Sherman Ave., New York City.....		April 19, 1920	
GRAHLMAN, THEODORE. 518 West 204th St., New York City.....		April 19, 1920	
HUCKABY, MARION COLUMBUS. Highway Engr., Good Roads Comm., St. Tammany Parish, Covington, La.....	Jun. Assoc. M.	Oct. 9, 1917 April 19, 1920	
JONES, CLARENCE STRAIN. Asst. Engr., The Missouri Val. Bridge & Iron Co., 319 Vine St., Leavenworth, Kans.....	Jun. Assoc. M.	Sept. 2, 1914 April 19, 1920	
KANDEL, CHARLES. Constr. Engr., International Oxygen Co., Box 288, Newark, N. J.....		April 19, 1920	
KLEIFELD, HENRY MOENNICK. City Engr.'s Office, W. 35 Fourteenth Ave., Spokane, Wash.....		Mar. 9, 1920	
KUGLER, RUDOLPH HOFFMANN. Res. Engr., N. Y. C. R. R. (Res., 330 Hatch St.), Syracuse, N. Y.....		April 19, 1920	
KURTZ, ADOLPH LAWRIE. Div. Engr., Sewerage Comm., 3526 Cherry St., Milwaukee, Wis.....		April 19, 1920	
LARSON, LEANDER. Capt., San. C., U. S. A., Care, Camp Surgeon, Camp Eustis, Va.....		Mar. 9, 1920	
LUTZ, RICHARD EUGENE. With Cowin & Co., Inc., 321 Security Bldg., Minneapolis, Minn.....		April 19, 1920	

ASSOCIATE MEMBERS (Continued)

Date of
Membership.

MACTIER, JAMES FREW. Chf. Engr., Virginia Iron, Coal & Coke Co., 1312 Maple Ave., Roanoke, Va.	April 19, 1920
MCKESSON, CLAUDE LEÓN. Senior Highway Engr., U. S. Bureau of Public Roads, Post Office Bldg., Room 204, Portland, Ore.	Mar. 9, 1920
McLOUGHLIN, FREDERIC OZANAM XAVIER. Secy., Faculty of Technology, The Coll. of the City of New York (Res., 706 Riverside Drive), New York City.	Jun. April 1, 1914 Assoc. M. April 19, 1920
MARCH, GEORGE RALPH. Sales Mgr., Iroquois Dept., The Barber Asphalt Paving Co., 1900 Land Title Bldg., Philadelphia, Pa.	April 19, 1920
MATTHEWS, ALBERT CLARK, JR. Asst. Pilot Engr., Valuation Dept., B. & O. R. R., 25 Conestoga Bldg., Pittsburgh, Pa.	Jun. Oct. 9, 1917 Assoc. M. April 19, 1920
MEANS, JOHN SIEMON. Field Engr., Colorado State Highway Comm. (Res., 1563 Downing St.), Denver, Colo.	Jun. April 18, 1916 Assoc. M. Mar. 9, 1920
MILLER, CHALMERS CASS. City Engr., City Hall, Lorain, Ohio	April 19, 1920
MULHOLLAND, WILLIAM MARTIN. Res. Engr., Little River Drainage Dist., 124 South Lorimier St., Cape Girar- deau, Mo.	April 19, 1920
MUTERSBAUGH, ALONZO MARSH. Lake Charles, La.	Mar. 9, 1920
OENCHAIN, WILLIAM ALEXANDER. Div. Engr., Highway Comm. of Texas, 6004 Bryan Parkway, Dallas, Tex.	April 19, 1920
ORT, ALBERT AUGUST LAMBERT. Lieut., C. E. C., U. S. N. R. F.; Address, Engineers Club, 1317 Spruce St., Philadelphia, Pa.	Jun. Sept. 3, 1912 Assoc. M. April 19, 1920
PARDOE, WILLIAM SPRAGUE. Asst. Prof., Univ. of Pennsylv- ania, Eng. Bldg., Univ. of Pennsylvania, Philadel- phia, Pa.	April 19, 1920
ROBINSON, WILLIAM ERNEST. Asst. Engr., Florida East Coast Ry., P. O. Box 525, St. Augustine, Fla.	Jun. Aug. 31, 1915 Assoc. M. Jan. 19, 1920
ROGERS, GEORGE EDWIN. Asst. Engr., Tex. & Pac. Ry., Valuation Dept., 1003 T. & P. Bldg., Dallas, Tex.	April 19, 1920
SAWYER, THORP DERICKSON. Care, Guggenheim Bros., Casilla 674, La Paz, Bolivia	Jan. 19, 1920
SCANLIN, WILLIAM ROBERT. Structural Engr., Philadelphia Rapid Transit Co., 2117 West Venango St., Philadel- phia, Pa.	April 19, 1920
SCOTT, HAL MCGINNIS. Cons. Engr., Nelson Fuel Co., Beckley, W. Va.	April 19, 1920

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
SHIVELY, CLARENCE OWEN. Asst. Div. Engr., The Miami Conservancy Dist., Germantown, Ohio.....	April 19, 1920
SPELMAN, HAROLD JAMES. Div. Engr., West Virginia State Road Comm., 107 Robson Prichard Bldg., Huntington, W. Va.....	April 19, 1920
VELTFORT, THEODORE ERNST. Care, Stone & Webster, 804 Book Bldg. (Res., 70 Worcester Pl.), Detroit, Mich.....	Jun. Mar. 4, 1913 Assoc. M. April 19, 1920
WENGER, EZRA C. 173 New York St., Aurora, Ill.....	April 19, 1920
WILKINSON, EPHRAIM BAILEY. City Engr., 208 East Adams Ave., Arkansas City, Kans.....	April 19, 1920
WILSON, BILLINGS. Yale Club, New York City.....	April 19, 1920
WINSTON, CHARLES A. Town Engr., Town Hall, West Orange, N. J.....	April 19, 1920

ASSOCIATES

LOCHER, HARRY ORRICK. Supt., Grant Smith & Co. & Locher, 918 Downer Ave., Utica, N. Y.....	April 19, 1920
MURPHY, WYNNE ALOYSIUS. Chf. Estimator, Irwin & Leighton, 126 North 12th St., Philadelphia, Pa.....	April 19, 1920

JUNIORS

BASSETT, HAROLD RHODES. 6330 Marchand St., E. E., Pittsburgh, Pa.....	Mar. 9, 1920
CLAUSSEN, THOMAS HIBBEN. Draftsman, Hunter & Hudson, 703 Rialto Bldg., San Francisco, Cal.....	Nov. 25, 1919
GREENOUGH, PERCY JULIAN. Engr., Woodhaven Water Supply Co., 4026 Fulton St., Woodhaven, N. Y.....	April 19, 1920
GREENATA, MICHAEL CHARLES. Capt., Corps of Engrs., U. S. A., The Engineer School, Camp A. A. Humphreys, Va.....	Mar. 9, 1920
HOPKINS, ALLAN VALENTINE. Chelsea Park, New Windsor Rd., Baulkham Hills, Sydney, New South Wales, Australia.....	Nov. 25, 1919
SCHROEDER, ROBERT ARMENAC. Designer, H. L. Cooper & Co., 101 Park Ave., New York City.....	April 19, 1920
TAN, CHEN. Care, Tientsin Optical Co., Tientsin, China.....	Mar. 9, 1920

DEATHS

ALDERMAN, CHARLES ALDO. Elected Associate Member, April 6th, 1898; Member, April 2d, 1902; died March 11th, 1920.	
BOGART, JOHN. Elected Member, February 17th, 1869; died April 25th, 1920.	
CHRISTIAN, GEORGE LYON. Elected Associate Member, March 6th, 1895; Member, October 3d, 1905; died April 25th, 1920.	

COE, WILLIAM WATSON. Elected Member, April 3d, 1889; died March 31st, 1920.

DAVIS, JOSEPH BAKER. Elected Junior, April 1st, 1874; Member, October 5th, 1898; died March 9th, 1920.

FULLER, FRANK LOUIS. Elected Junior, April 4th, 1883; Member, April 4th, 1888; died January 30th, 1920.

OSBORN, FRANK EDGAR. Elected Associate Member, December 31st, 1913; died March 17th, 1919.

PARSONS, HENRY CUTLER. Elected Member, October 6th, 1886; died April 5th, 1919.

SAPH, AUGUSTUS VALENTINE. Elected Associate, October 1st, 1901; Associate Member, June 4th, 1907; Member, October 29th, 1912; died February 13th, 1920.

VAN WINKLE, EDGAR BEACH. Elected Member, December 2d, 1868; died April 27th, 1920.

Total Membership of the Society, May 1st, 1920,

9490.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(April 1st to April 30th, 1920)

NOTE.—This list is published for the purpose of placing before the members of this Society the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

- | | |
|---|---|
| (2) <i>Journal</i> , Engrs. Club of Phila., Philadelphia, Pa. | (41) <i>Elektrotechnische Zeitschrift</i> , Berlin, Germany. |
| (3) <i>Journal</i> , Franklin Inst., Philadelphia, Pa., 50c. | (42) <i>Journal</i> , Am. Inst. Elec. Engrs., New York City, \$1. |
| (4) <i>Journal</i> , Western Soc. of Engrs., Chicago, Ill., 50c. | (43) <i>Annales des Ponts et Chaussées</i> , Paris, France. |
| (5) <i>Journal</i> , Eng. Inst. of Canada, Montreal, Que., Canada. | (45) <i>Coal Age</i> , New York City, 15c. |
| (6) <i>Journal</i> , Am. Inst. of Archts., Washington, D. C., 50c. | (46) <i>Scientific American</i> , New York City, 15c. |
| (7) <i>Gesundheits Ingenieur</i> , Munich, Germany. | (47) <i>Mechanical Engineer</i> , Manchester, England, 3d. |
| (8) <i>Stevens Indicator</i> , Hoboken, N. J., 50c. | (48) <i>Zeitschrift, Verein Deutscher Ingenieure</i> , Berlin, Germany, 1, 60 m. |
| (9) <i>Industrial Management</i> , New York City, 25c. | (49) <i>Zeitschrift für Bauwesen</i> , Berlin, Germany. |
| (11) <i>Engineering</i> (London), W. H. Wiley, 432 Fourth Ave., New York City, 25c. | (50) <i>Stahl und Eisen</i> , Düsseldorf, Germany. |
| (12) <i>The Engineer</i> (London), International News Co., New York City, 35c. | (53) <i>Zeitschrift, Oesterreichischer Ingenieur und Architekten-Verein</i> , Vienna, Austria, 70h. |
| (13) <i>Engineering News-Record</i> , New York City, 15c. | (54) <i>Transactions</i> , Am. Soc. C. E., New York City, \$16. |
| (15) <i>Railway Age</i> , New York City, 15c. | (55) <i>Mechanical Engineering: Journal</i> , Am. Soc. M. E., New York City, 35c. |
| (16) <i>Engineering and Mining Journal</i> , New York City, 15c. | (56) <i>Transactions</i> , Am. Inst. Min. and Metallurgical Engrs., New York City, \$6. |
| (17) <i>Electric Railway Journal</i> , New York City, 10c. | (57) <i>Colliery Guardian</i> , London, England, 5d. |
| (18) <i>Railway Review</i> , Chicago, Ill., 15c. | (58) <i>Proceedings</i> , Engrs.' Soc. of W. Pa., 2511 Oliver Bldg., Pittsburgh, Pa., 50c. |
| (19) <i>Scientific American Monthly</i> , New York City, 10c. | (59) <i>Proceedings</i> , American Water Works Assoc., Troy, N. Y. |
| (20) <i>Iron Age</i> , New York City, 20c. | (60) <i>Municipal and County Engineering</i> , Indianapolis, Ind., 25c. |
| (21) <i>Railway Engineer</i> , London, England, 1s. 2d. | (61) <i>Proceedings</i> , Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c. |
| (22) <i>Iron and Coal Trades Review</i> , London, England, 6d. | (62) <i>American Drop Forger</i> , Thaw Bldg., Pittsburgh, Pa., 10c. |
| (24) <i>American Gas Engineering Journal</i> , New York City, 10c. | (63) <i>Minutes of Proceedings</i> , Inst. C. E., London, England. |
| (25) <i>Railway Mechanical Engineer</i> , New York City, 20c. | (64) <i>Power</i> , New York City, 10c. |
| (26) <i>Electrical Review</i> , London, England, 4d. | (65) <i>Official Proceedings</i> , New York Railroad Club, Brooklyn, N. Y., 15c. |
| (27) <i>Electrical World</i> , New York City, 10c. | (66) <i>Gas Journal</i> , London, England, 6d. |
| (28) <i>Journal</i> , New England Water-Works Assoc., Boston, Mass., \$1. | (67) <i>Cement and Engineering News</i> , Chicago, Ill., 25c. |
| (29) <i>Journal</i> , Royal Soc. of Arts, London, England, 6d. | (69) <i>Eisenbau</i> , Leipzig, Germany. |
| (32) <i>Mémoires et Compte Rendu des Travaux</i> , Soc. Ing. Civ. de France, Paris, France. | (71) <i>Journal</i> , Iron and Steel Inst., London, England. |
| (33) <i>Le Génie Civil</i> , Paris, France, 1 fr. | (71a) <i>Carnegie Scholarship Memoirs</i> , Iron and Steel Inst., London, England. |
| (36) <i>Cornell Civil Engineer</i> , Ithaca, N. Y. | |
| (40) <i>Zentralblatt der Bauverwaltung</i> , Berlin, Germany, 60 pfg. | |

- (72) *American Machinist*, New York City, 15c.
 (73) *Electrician*, London, England, 18c.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
 (78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
 (80) *Industrie Zeitung*, Berlin, Germany.
 (83) *Gas Age*, New York City, 15c.
 (85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
 (86) *Engineering and Contracting*, Chicago, Ill., 10c.
 (87) *Railway Maintenance Engineer*, Chicago, Ill., 10c.
 (88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
 (89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., \$5.
 (90) *Transactions*, Inst. of Naval Archts., London, England.
 (91) *Transactions*, Soc. of Naval Archts. and Marine Engrs., New York City.
 (92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
 (93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (98) *Journal*, Engrs. Soc. of Pa., Harrisburg, Pa., 30c.
 (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$2.
 (100) *Military Engineer: Journal* of the Society of American Military Engineers, Washington, D. C., 75c.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
 (105) *Chemical and Metallurgical Engineering*, New York City, 25c.
 (106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (109) *Journal*, Boston Soc. C. E., Boston, Mass., 50c.
 (111) *Journal of Electricity*, San Francisco, Cal., 25c.
 (113) *Proceedings*, Am. Wood Preservers' Assoc., Baltimore, Md.
 (114) *Journal*, Institution of Municipal and County Engineers, London, England, 1s. 6d.
 (115) *Journal*, Engrs. Club of St. Louis, St. Louis, Mo., 35c.
 (116) *Blast Furnace and Steel Plant*, Pittsburgh, Pa., 15c.
 (117) *Engineering World*, Chicago, Ill.
 (118) *Times Engineering Supplement*, London, England, 2d.
 (119) *Landscape Architecture*, Harrisburg, Pa., 50c.
 (120) *Automotive Industries*, New York City, 15c.
 (121) *Proceedings*, Am. Concrete Inst., Boston, Mass.

LIST OF ARTICLES

Bridges.

- The Raising and Repair of the Railway Bridge at Houplines.* E. M. Sinauer. (From *The Royal Engineers' Journal*.) (88) Oct.-Dec., 1919.
 Widening of Road Bridges by Ferro-Concrete Cantilever Sidewalks.* (From *The Surveyor*.) (86) Mar. 31.
 Framing Howe Trusses Before Treatment.* (87) Apr.
 Arch Reaction Influence Lines by Deflection Diagrams.* C. B. McCullough. (13) Apr. 1.
 Three Double-Leaf Bascule Bridges at Seattle, Wash.* F. A. Rapp. (13) Apr. 8.
 Southern Railway Rebuilds Chattanooga Bridge.* (15) Apr. 9.
 Heavy Foundation Work for Bascule Bridge at Seattle.* F. A. Rapp. (13) Apr. 15.
 A Swingbridge Accident of a New Kind; Repair of Damage. (13) Apr. 22.
 An Interesting Type of Flat Slab Construction.* (Viaduct.) (15) Apr. 23.
 Truss Centering Used for 113-Ft. Concrete Arch.* C. B. McCullough. (13) Apr. 29.
 Construction Trestle Plans and Quantity Tables.* F. J. Herlihy. (13) Apr. 29.
 Die Wiederherstellung der Donaubrücke bei Cernavoda durch die Maschinenfabrik Augsburg-Nürnberg A.-G., Werk Gustavsburg.* (48) Serial beginning Jan. 3.
 Arbeiten deutscher Eisenbau-Werke aus den Kriegsjahren 1914 bis 1918.* H. Bösenberg. (50) Serial beginning Jan. 22.
 Klappbrücke von 42 m Spannweite im Hafen von La Seyne bei Toulon.* (107) Feb. 14.

Electrical.

- On the Localisation of High-Resistance Breaks in Submarine Cables.* Q. Poulsen. (73) Mar. 19.
 The Single-Field Cascade Machine.* L. J. Hunt. (Abstract of paper read before South Wales Inst. of Engrs.) (57) Mar. 19; (73) Apr. 16.
 Flashing of 60-Cycle Synchronous Converters and Some Suggested Remedies.* Marvin W. Smith. (42) Apr.

* Illustrated.

Electrical—(Continued).

- Automatic Substations for Heavy City Service.* R. T. Wensley. (42) Apr.
 The Audion Oscillator.* R. A. Heising.* (42) Serial beginning Apr.
 Economic Voltage of Long Transmission Lines.* Henry H. Plumb. (42) Apr.
 Magnetic and Electrical Properties of Iron-Nickel Alloys.* T. D. Yensen. (42) Apr.
 The Fixation of Atmospheric Nitrogen by the Silent Electric Discharge Process. C. Francis Harding and K. B. McEachron. (42) Serial beginning Apr.
 The Cause of Static Phenomena on Ignition Cables.* Harry F. Geist. (120) Apr. 1.
 Telephoning from the Air.* Roy J. Heffner. (111) Apr. 1.
 Limiting Substation Short-Circuits.* R. F. Gooding. (27) Serial beginning Apr. 3.
 Third Harmonics in Three-Phase Systems.* D. I. Cone. (27) Apr. 3.
 Single-Phase Load on a Three-Phase Power System.* J. B. Gibbs. (64) Apr. 6.
 Synchronous Motor Starting Problems.* E. E. George. (27) Serial beginning Apr. 10.
 Testing on a Grounded Circuit.* E. C. Parham. (64) Apr. 13.
 Wiring for Electric Light in Small Houses. Alan Kirk. (73) Apr. 16.
 Correcting Synchronous-Motor V-Curves.* Jacob R. Collins. (27) Apr. 17.
 Iron and Steel Wire for Transmission.* R. W. Goddard. (27) Apr. 17.
 Three-Phase Power from Single-Phase Transformer Connections.* J. B. Gibbs. (64) Apr. 27.
 Leuchtfäden aus Kristalldraht.* O. Ely. (48) Jan. 12, 1918.
 Die Bedeutung elektrisch betriebener Kleinhebezeuge für die Industrie.* Carl Bütke. (107) Jan. 17.
 Das Gewicht des isolierten Runddrahtes. Julius Müller. (53) Feb. 20.

Marine.

- The Armstrong Shipyard.* (11) Serial beginning Mar. 19.
 Add Interior Braces and Stirrups to Concrete Tankers.* (13) Apr. 8.
 Soft Ground Complicates Dry-Dock Construction.* Charles A. Lee. (13) Apr. 15.
 Das Gasschiff der preussischen Medizinalverwaltung zum Ausgasen pestverdächtiger Schiffe; Eine Verbindung des CO- und eines neuen SO₂-Verfahrens.* A. Rudolf and Fritz Kirstein. (48) Mar. 30, 1918.
 Ueber die Entwicklung des Kampschiffes.* Hüllmann. (48) Serial beginning June 29, 1918.
 Deutsche Eisenbetonschiffe.* W. Kaemmerer. (48) Sept. 14, 1918.
 Der Vierschrauben-Turbinendampfer *Vateland* der Hamburg-Amerika-Linie erbaut von Blohm & Voss in Hamburg.* E. Foerster and G. Sütterlin. (48) Serial beginning Nov. 30, 1918.
 Die Staatswerft in Emden.* Paulmann. (49) Pt. 10, 1919.
 Donauschleppkähne aus Eisenbeton.* E. Foerster. (48) Oct. 18, 1919.
 Der Bau von Unterseeböten auf der Germania-Werft.* H. Techel. (48) Serial beginning Oct. 25, 1919.
 Motorschiffe für grosse Fahrt.* Ludwig Benjamin. (48) Nov. 15, 1919.

Mechanical.

- Electric Arc Welding.* W. M. B. Brady. (61) Feb.
 Liquid Purification of Gases.* Lester M. Goldsmith. (83) Feb. 25.
 Tests of Fire Clay Mortars.* Raymond M. Howe. (Paper read before Refractory Mfrs. Assoc.) (83) Feb. 25.
 Fractional Condensation of Tar. (From *Journal für Gasbeleuchtung*.) (83) Mar. 10.
 Corrosion of Condenser Tubes. Guy D. Bengough and others. (Abstract from Fifth Report read before Inst. of Metals.) (22) Mar. 12.
 Waste Heat Saving. H. L. Nickerson. (Paper read before N. E. Assoc. of Gas Engrs.) (83) Mar. 25.
 Mechanical Properties of Turbine Steels. W. H. Hatfield and H. M. Duncan. (Abstract of paper read before North East Coast Inst. of Engrs. and Shipbuilders.) (22) Mar. 26.
 Heat Conservation and Water Gas.* Edward G. Stewart. (Paper read before London and Southern District Junior Gas Assoc.) (66) Mar. 30.
 Motorizing Terminal.* B. F. Fitch. (117) Apr.
 An Aerodynamical Torsion Balance.* A. F. Zahm. (3) Apr.
 Development of the Internal Combustion Engine.* T. Blackwood Murray. (Paper read before Inst. of Engrs. and Shipbuilders in Scotland.) (19) Apr.
 Losses from Long Superheat Steam Pipes Determined by Means of Curves.* Thomas G. Estep. (116) Apr.
 Reliability of Materials and Mechanism of Fractures.* Charles De Fremenville. (55) Apr.
 Physical Basis of Air-Propeller Design.* F. W. Caldwell and E. N. Fales. (55) Apr.
 Simplification of Venturi Meter Calculations.* Glenn B. Warren. (55) Apr.

* Illustrated.

Mechanical—(Continued).

- Pulverized Coal in Metallurgical Furnaces at High Altitudes.* Otis L. McIntyre. (55) Apr.
- The Dissipation of Heat by Various Surfaces.* T. S. Taylor. (55) Apr.
- "Big Bertha": The German Long-Range Gun.* (118) Apr.
- Heat Treating Steel by New Methods Claims Valuable Results.* (For Automobiles.) (120) Apr. 1.
- Lowering Splint Coal Down a Mountain with Minimum Breakage.* Josiah Keely. (45) Apr. 1.
- Tests Reveal Relative Values of Pneumatic and Solid Tires.* Alfred F. Masury. (13) Apr. 1.
- The Machinery of H. M. Airships R. 33 and R. 34.* (11) Serial beginning Apr. 2.
- Gas-Steam Unit Shows 72.4 Per Cent. Thermal Efficiency at Ford Works.* L. D. Royer. (64) Apr. 6.
- Oil as a Fuel for Boilers and Furnaces.* H. H. Fleming. (Abstract of paper read before Am. Soc. of Heating and Ventilating Engrs.) (64) Apr. 6.
- The Combustion of Complex Gaseous Mixtures.* William Payman. (66) Apr. 6.
- A New Thermodynamic Cycle.* William J. Walker. (11) Apr. 9.
- Lubrication of Internal-Combustion Engines. W. F. Osborne. (64) Apr. 13.
- New Sinclair Boiler Plant at East Chicago.* (64) Apr. 13.
- Diminution of Waste Heat Losses in Water-Gas Operation. H. L. Nicholson. (Paper read before New England Assoc. of Gas Engrs.) (66) Apr. 13.
- Load Factors for Aeroplanes and Seaplanes.* (11) Apr. 16.
- Study of Flight Vortices.* F. W. Caldwell and E. N. Fales. (11) Serial beginning Apr. 16.
- Location of Flaws in Rifle-Barrel Steel by Magnetic Analysis.* R. L. Sanford and Wm. B. Kouwenhoven. (72) Apr. 22.
- Tests of Lubricants for the Internal Combustion Engine.* Fred C. Ziesenheim. (120) Apr. 22.
- Burning Low-Grade Coals of the Southwest.* W. M. Park. (27) Apr. 24.
- Charts for Graphical Determination of Pipe Sizes and Velocity of Flow of Steam.* H. M. Brayton. (64) Apr. 27.
- Die Kohlenstaubfeuerung in den Vereinigten Staaten. Robert J. Weitlaner. (50) Sept. 6, 1917.
- Luftgas-oder Mischgas-Generatorbetrieb? D. J. Hudler. (50) Dec. 20, 1917.
- Die rechnerische Nachprüfung und Ergänzung der Kuppelofengasanalyse. Bernhard Osann. (50) Dec. 27, 1917.
- Das Handley-Page-G-Flugzeug.* (48) Dec. 28, 1918.
- Die Wirtschaftlichkeit von Nebenprodukthanlagen für Kraftwerke.* G. Klingenberg. (48) Serial beginning Jan. 5, 1918.
- Die Abhängigkeit des Thomson-Joule-Effektes für Luft von Druck und Temperatur bei Drücken bis 150 at und Temperaturen von -55° bis $+250^{\circ}$ C. Friedrich Noell. (48) Serial beginning Feb. 2, 1918.
- Die Entwicklung der Maschinen für Flugzeuge in England. A. Heller. (48) Feb. 9, 1918.
- Der Nutzen elastischer Kupplung von Kraft-und Arbeitsmaschine.* Otto Ohnesorge. (48) Feb. 16, 1918.
- Die zukünftige Kohlenwirtschaft im Hause.* Karl Brabbée. (48) Serial beginning Feb. 16, 1918.
- Die Nebenproduktengewinnung aus Generatorgas und ihre Beziehung zur Krafterzeugung.* H. R. Trenkler. (48) Feb. 23, 1918.
- Das Einblaseventil des Dieselmotors.* W. Stremme. (48) Mar. 9, 1918.
- Die Beziehungen zwischen Rad und Schiene hinsichtlich des Kräftefeldes und der Bewegungsverhältnisse.* J. Jahn. (48) Serial beginning Mar. 16, 1918.
- Die Stützung von Dampfkesseln und von Wasserleitungen.* E. Höhn. (48) Mar. 23, 1918.
- Elektrisch betriebener fahrbarer Greifer-Drehkran.* Bruno Müller. (48) Mar. 30, 1918.
- Untersuchungen zur Frage der Dampfmaschinenschmierung. Hilliger. (48) Serial beginning Apr. 6, 1918.
- Ein neuer Torsionsindikator mit Lichtbildaufzeichnung und seine Ergebnisse.* Hermann Frähm. (48) Apr. 6, 1918.
- Deutsche Industriennormen.* Heilandt. (48) Serial beginning Apr. 13, 1918.
- Neue Beiträge zum Kapitel: Kritische Drehzahlen schnellumlaufender Wellen.* Gustav Kull. (48) Serial beginning May 4, 1918.
- Ueber technische Anpassungen in der Natur.* A. Leon. (48) Serial beginning June 8, 1918.
- Expansion und deren Nutzen in Anwendung auf die direkt wirkenden schwungradlosen Dampfpumpen.* A. Musmann. (48) June 15, 1918.
- Saugzug oder Unterwind. Rudolf Kaesbohrer. (48) June 15, 1918.
- Ueber die Sicherung der Schweissnähte von Wasserkammern.* Friedrich Münzinger. (48) July 13, 1918.
- Der Bericht des englischen Amtes für Brennstofforschung. (48) July 13, 1918.

* Illustrated.

Mechanical—(Continued).

- Untersuchung von Drahtseilen.* Rudolf Wahn. (48) Serial beginning July 20, 1918.
- Die Verwendung von Zechenkoks zur Dampferzeugung.* Alfred Stober. (48) Serial beginning July 20, 1918.
- Verbund-Stufentrockner.* Karl Reyscher. (48) Aug. 3, 1918.
- Elniges über Dampfmesser.* Ernst Claassen. (48) Aug. 10, 1918.
- Ein neues Pyrometer.* F. Hirschson. (48) Aug. 17, 1918.
- Massenwirkungen von Getriebegruppen.* H. Lorenz. (48) Aug. 24, 1918.
- Die Reibungsverhältnisse in Spurzapfenlagern.* Adolf Neumann. (48) Aug. 24, 1918.
- Neues graphisches Verfahren auf statischer Grundlage zur Untersuchung beliebiger Wellen-Massensysteme auf freie Drehschwingungen.* Rudolf Dreves. (48) Serial beginning Aug. 31, 1918.
- Rollbahnen und ihre Anwendung für die Stückgutverladung.* Landsberg. (48) Serial beginning Aug. 31, 1918.
- Erfahrungen an der Beschaffung von Dampfturbine.* O. Lasche. (48) Serial beginning Aug. 31, 1918.
- Die Wärmeleitfähigkeit von feuerfesten Steinen bei hohen Temperaturen sowie von Dampfrohrschrutmassen und Mauerwerk unter Verwendung eines neuen Verfahrens der Oberflächetemperaturmessung.* Willem van Rinsum. (48) Serial beginning Sept. 7, 1918.
- Die hervorragende Anpassungsfähigkeit des elektrischen Antriebmotors an die jeweiligen Betriebsverhältnisse.* Wintermeyer. (48) Serial beginning Sept. 28, 1918.
- Die Sicherheit geschweisster Wasserkammern an Rohrkesseln.* Herm. Bussmann. (48) Serial beginning Sept. 28, 1918.
- Untersuchungen an der Dieselmachine.* Kurt Neumann. (48) Serial beginning Oct. 12, 1918.
- Die neuzeitliche Heissdampf-Strassenlokomotive (Zuglokomobile) mit besonderer Berücksichtigung der Ausführung von R. Wolf A.-G., Magdeburg-Buckau.* A. Dahme. (48) Serial beginning Nov. 16, 1918.
- D I Normen über Passungen.* (48) Nov. 23, 1918.
- Brennöfen für kleine Zeigeleien. Alfred Schmidt. (80) Dec. 2, 1919.
- Technische Anwendungen der Kreiselbewegung.* H. Lorenz. (48) Serial beginning Dec. 6, 1919.
- Maschinenfundamentschäden in Kraftwerken. O. Springmann. (48) Dec. 20, 1919.
- Ueber Explosionen an Rauchgasvorwärmern.* G. v. Doepp. (48) Dec. 20, 1919.
- Die Erzeugungsstätte und das Herstellungsverfahren der amerikanischen Stahlgussketten.* Carl Irresberger. (50) Dec. 25, 1919.
- Das Wärmediagramm als Grundlage für die Untersuchung einer Oelmaschine.* Zwerger. (48) Dec. 27, 1919.
- Die spezifischen Wärmen der Gase für feuerungstechnische Berechnungen. Bernhard Neumann. (50) Serial beginning July 3, 1919.
- Die Absaugung der Füllgase im Kokereibetriebe.* Otto Ohnesorge. (50) July 3, 1919.
- Torfkohle als Ersatz für Holzkohle. J. W. Bleymüller. (50) Aug. 7, 1919.
- Abdampfheizung als Dampfersparnis bei der Fördermaschine.* A. Lütchen. (48) Sept. 27, 1919.
- Zur Geometrie der Riementreibe.* Georg Duffing. (48) Sept. 27, 1919.
- Ueber den Warmedurchgang an Heizkörpern von Dampfpfannen.* Karl Fehrmann. (48) Oct. 4, 1919.
- Maschinenfundamentschäden in Kraftwerken.* Schirp. (48) Oct. 4, 1919.
- Die Zerlegung der Kräfte bei schletem Winddruck und der Dinessche Höcker.* H. Haedicke. (48) Oct. 4, 1919.
- Flugzeuggebläse.* W. G. Noack. (48) Serial beginning Oct. 11, 1919.
- Die Adiabate der Kohlensäure bei hohen Temperaturen.* Kurt Neumann. (48) Oct. 11, 1919.
- Studien über die Vorschriften für die Beförderung verdichteter und verflüssigter Gase auf Eisenbahnen.* A. Wogrinz and F. Halla. (53) Serial beginning Oct. 17, 1919.
- Kammerschieber, Bauart Hochwald, für Dampfmaschinen.* M. Hochwald. (48) Oct. 18, 1919.
- Drahtgledertreibriemen mit weicher Lauffläche.* Hans Mittermayr. (48) Oct. 25, 1919.
- Einheitswelle oder Einheitsbohrung. Klein, Knecht and Schlesinger. (48) Nov. 22, 1919.
- Der 3 t-Kardan-Lastkraftwagen von H. Büssing in Braunschweig.* A. Heller. (48) Nov. 22, 1919.
- Massenausgleich bei Kurbelgetrieben, insbesondere durch Gegengewichte.* Rudolf Besthorn. (48) Jan. 10.
- Der elektrische Antrieb der Papiermaschine.* Wilhelm Stiel. (48) Serial beginning Jan. 10.

Mechanical—(Continued).

- Der 300 PS-Flugmotor von Benz & Cie. A.-G., Mannheim.* A. Heller. (48) Jan. 10.
 Die Bedeutung elektrisch betriebener Kleinhebezeuge für die Industrie.* Carl Bütke. (107) Jan. 17.
 Unsere Wälder und die Ziegelöfen. Fritz Emperger. (50) Jan. 23.
 Die Heranziehung des Braunkohlenbergbaues zur Linderung der Kohlennot.* Kegel. (48) Serial beginning Feb. 7.
 Lasthebe- und Fördermaschinen mit Gleichstrombetrieb. Ernst Blau. (53) Feb. 13.
 Ausstellung für Brennstoff-Ersparung in Wien. Beranek. (53) Feb. 27.
 Die Entwicklung der Holzwarth-Gasturbine seit 1914.* Hans Holzwarth. (48) Feb. 28.

Metallurgical.

- On the Decarburisation of Steel with Hydrogen.* E. D. Campbell. (71) Vol. 100, 1919.
 On the Cause of the Irreversibility of Nickel Steels.* Kōtarō Honda and Hiromri Takagi. (71) Vol. 100, 1919.
 Some Experiments on Nickel Steel.* N. Hudson. (71) Vol. 100, 1919.
 Temper-Brittleness of Nickel-Chrome Steel.* R. H. Greaves. (71) Vol. 100, 1919.
 Nickel Chrome Forgings.* J. H. Andrew and others. (71) Vol. 100, 1919.
 Notes on Defective Fractures in Tensile Test-Pieces During the Inspection of Gun Parts.* A. M. Portevin. (71) Vol. 100, 1919.
 On the Woody Structures of Fractures of Transverse Test-Pieces Taken from Certain Special Steels.* J. J. Cohade. (71) Vol. 100, 1919.
 The Action of Iron Oxides Upon the Acid Furnace Structure.* J. H. Whiteley and A. F. Hallimond. (71) Vol. 100, 1919.
 Synthetic Cast Iron.* Charles Albert Keller. (71) Vol. 100, 1919.
 A Report on the Present Status of Fuel Economy in the German Iron and Steel Industry of the Occupied Territory on the Left Bank of the Rhine.* Cosmo Johns and Lawrence Ennis. (71) Vol. 100, 1919.
 Report on Experimental Use of Powdered Fuel for Puddling Furnaces. W. Simons. (71) Vol. 100, 1919.
 Fuel Control in Metallurgical Furnaces.* Robert Hadfield. (71) Vol. 100, 1919.
 Fuel Economy in Cupola Practice. H. James Yates. (71) Vol. 100, 1919.
 Report on Fuel Economy and Consumptions in the Manufacture of Iron and Steel.* William A. Bone and others. (71) Vol. 100, 1919.
 Note on the Structure of Iron-Carbon-Chromium Alloys.* Takejiro Murakami. (71) Vol. 100, 1919.
 On the Nature of the A-1 Transformation, and a Theory of Quenching.* K. Honda. (71) Vol. 100, 1919.
 Distinguishing Lead in Brass and Bronze.* F. P. Gilligan and J. J. Curran. (20) Mar. 4.
 The Removal of Internal Stress in 70:30 Brass by Low Temperature.* H. Moore and S. Beckinsale. (Paper read before Inst. of Metals.) (11) Mar. 19.
 Some Notes on the Effects of Hydrogen on Copper.* W. C. Hothersall and E. L. Rhead. (Paper read before Inst. of Metals.) (11) Mar. 19.
 The Art of Casting in High Tensile Brass.* Neil J. Maclean. (Paper read before Inst. of Metals.) (11) Mar. 19.
 A Method of Measuring the Magnetic Hardness of Ferrous Metals and Its Utility for Carrying Out Research Work on Thermal Treatment.* L. A. Wild. (Abstract of paper read before Faraday Soc.) (73) Mar. 19.
 A New Abrasive of Aluminous Material.* Otis Hutchins. (20) Mar. 25.
 Hot Flow of Steel during Ordinary Processes of Manufacture.* J. Neill Greenwood. (Abstract of paper read before Staffordshire Iron and Steel Inst.) (22) Mar. 26.
 Magnetic and Electrical Properties of Iron-Nickel Alloys.* T. D. Yensen. (42) Apr.
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 Electric Rolling Mill Drive Equipment.* J. D. Wright. (Paper read before Assoc. of Iron and Steel Elec. Engrs.) (116) Apr.
 Electrical Features of a Modern Steel Plant.* R. B. Gerhardt. (Paper read before Assoc. of Iron and Steel Elec. Engrs.) (2) Apr.
 Methods for Analytical Control of Electrolytic Zinc Production.* H. F. Bradley. (105) Apr. 7.
 The Economics of Ore Concentration. R. T. Hancock. (16) Apr. 10.
 Examinations of Mill Returns. Douglas Lay. (16) Apr. 10.
 Curves to Show What a Ball Mill Should Do.* Thomas E. Fisher. (16) Apr. 10.
 Sulphatizing Roasting of Basic Mill Tailings.* Walter L. Maxson. (16) Apr. 10.
 Reducing Tungsten Ore. T. Sington. (16) Apr. 10.
 Electric Furnace Smelting of Montana Manganese Ore.* E. S. Bardwell. (Paper read before Am. Electrochemical Soc.) (105) Apr. 14.
 The Elastic Development of Steel.* Sidney Cornell. (105) Apr. 14.

* Illustrated.

Metallurgical—(Continued).

- Manufacture of Electric Ferroalloys.* C. B. Gibson. (From paper read before Am. Electrochemical Soc.) (20) Apr. 15.
- A Model for Representing the Constitution of Ternary Alloys. Walter Rosenhain. (Paper read before Inst. of Metals.) (11) Apr. 16.
- Genesis of Ferrite.* Federico Giolitti. (105) Apr. 21.
- Manufacture of Carbon Electrodes for Electric Furnace Purposes. Walter L. Morrison. (105) Apr. 21.
- The Söderberg Self-Baking Electrode.* Joseph W. Richards. (From paper read before Am. Electrochemical Soc.) (20) Apr. 22.
- Slag and the Corrosion of Wrought Iron.* L. T. Richardson. (From paper read before Am. Electrochemical Soc.) (20) Apr. 22.
- Design of Open-Hearth Furnaces.* A. D. Williams. (20) Serial beginning Apr. 29.
- Annealing with Gas.* W. A. Ehlers. (46) May 1.
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- Etude Comparative de la Marche des Hauts-Fourneaux Electriques et des Hauts-Fourneaux au Coke.* Marcel Guédras. (93) Jan.
- L'Hétérotropie de l'Acier Forgé.* J. Descolas. (93) Jan.
- Sur la Structure des Aciers au Tungstène.* Kotaro-Honda et Takejiro Murakami. (93) Jan.
- L'Avenir des Fours Martin Bacculants en France.* P. Jolly. (93) Jan.
- Wirtschaftlicher Ofenbetrieb.* (50) July 5, 1917.
- Allgemeine Gesichtspunkte, Grundsätze und Regeln bei Anlage einer Giesserei.* E. Leber. (50) July 26, 1917.
- Die Durchstrahlung von Metallen mittels Röntgenstrahlen.* G. Respondek. (50) Aug. 2, 1917.
- Eisen und Kohle in Frankreichs Zukunftsabsichten. Ferdinand Moos. (50) Aug. 9, 1917.
- Betrachtungen über Flusseisenblöcke. (50) Serial beginning Aug. 23, 1917.
- Erfahrungen mit der Frauenarbeit in der Kriegsindustrie mit besonderer Berücksichtigung des Giessereiwesens.* Kurt Abeking. (50) Aug. 30, 1917.
- Ueber den Einfluss des Warmwalzens auf die mechanischen Eigenschaften und das Gefüge des Kohlenstoffarmen Flusseisens.* F. Wüst and W. C. Huntington. (50) Serial beginning Sept. 13, 1917.
- Die praktische Anwendung der Metallographie in der Eisen- und Stahlgiesserei.* R. Durrer. (50) Serial beginning Sept. 27, 1917.
- Die Herstellung von Ferromangan im Hochofen.* Oskar Simmersbach. (50) Serial beginning Oct. 4, 1917.
- Unterwindfeuerungen für Halbgasöfen.* H. Markgraf. (50) Oct. 18, 1917.
- Die geschichtliche Entwicklung der Oberschlesischen Eisenbahn-Bedarfs-Aktien-Gesellschaft.* Oskar Simmersbach. (50) Serial beginning Nov. 8, 1917.
- Die Druckluftheizung der steinernen Winderhitzer. D. G. Jantzen. (50) Nov. 22, 1917.
- Die Ursache einer unvermuteten Gasflaschen-Explosion.* Carl Brisker. (50) Dec. 6, 1917.
- Die Eisen- und Stahlgiessereien der Birdsboro Steel-Foundry and Machine Comp. in Birdsboro, Pa.* Carl Irresberger. (50) Dec. 27, 1917.
- Die metallurgischen Vorgänge beim sauren und basischen Windfrischverfahren auf Grund spektralanalytischer Beobachtungen.* L. C. Glaser. (50) Serial beginning Jan. 15, 1919.
- Ueber die Abhängigkeit der magnetischen Eigenschaften, des spezifischen Widerstandes und der Dichte der Eisenlegierungen von der chemischen Zusammensetzung und der thermischen Behandlung.* E. Gumlich. (50) Serial beginning July 10, 1919.
- Amerikanische Blechwalzwerks-Anlage neuartiger Ausführung.* G. Asbeck. (50) July 24, 1919.
- Aus der Praxis der Kleinbessemerei. Leonh. Treuhelt. (50) July 31, 1919.
- Magnetverwendung in Eisenhüttenwerken.* Ernst Blau. (50) Aug. 14, 1919.
- Statistische Angaben über die metallurgischen Oefen der deutschen Eisenindustrie in den Jahren 1908 bis 1914. K. Bierbrauer. (50) Aug. 14, 1919.
- Die Wärmerechnung des Konverters. Bernhard Osann. (50) Aug. 21, 1919.
- Die Rekristallisation des Eisens.* P. Oberhoffer and W. Oertel. (50) Sept. 11, 1919.
- Beitrag zur Regelung der Gaswirtschaft auf Hüttenwerken.* M. Schlipköter. (50) Sept. 18, 1919.
- Ueber die Schmierung von Walzenlagern und Zapfen.* Richard Hein. (50) Oct. 2, 1919.
- Stromersparnis bei elektrischen Stahlwerksöfen.* F. Hartig. (50) Oct. 2, 1919.
- Kippbare Martinöfen.* Fr. Dittmer. (48) Dec. 20, 1919.
- Selbsttätige Elektroden-Regelvorrichtung für Lichtbogen-Elektroöfen.* E. Fr. Russ. (50) Dec. 25, 1919.

* Illustrated.

Metallurgical—(Continued).

- Die Beheizung von Martinöfen mit kaltem Kokofengas.* F. Springorum. (50) Jan. 1.
 Die Abkühlung hochofener Eisenkörper und die Temperaturverteilung in deren Innerem.* Fried. Riedel. (50) Jan. 1.
 Einiges aus der Werkstätte des Edelstahlwerkers. Erdmann Kothny. (50) Jan. 8.
 Ueber das Rosten von Eisen in Berührung mit anderen Metallen und Legierungen.* O. Bauer and O. Vogel. (50) Serial beginning Jan. 8.
 Ueber das Blockwalzen. C. Kiesselbach. (50) Jan. 15.
 Die Antriebe von Stahlwerkgebläsen.* Hubert Hermanns. (50) Serial beginning Jan. 17.
 A. S. Norsk Valseverk. Wilh. Krämer. (50) Feb. 12.

Military.

- History of the 26th Engineers, U. S. A.* (28) Dec., 1919, Section 2.
 "Big Bertha": The German Long-Range Gun. (118) Apr.
 Ueber die Entwicklung des Kampschiffes.* Hüllmann. (48) Serial beginning June 29, 1918.
 Der Bau von Unterseebooten auf der Germanlawerft.* H. Techel. (48) Serial beginning Oct. 25, 1919.

Mining.

- Some Recent Improvements in Miners' Electric Lamps.* William Maurice. (106) Mar.
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 Notes on Coal Dust Experiments.* R. W. Anderson. (Paper read before North of England Inst. of Min. and Mech. Engrs.) (22) Apr. 2.
 A Safety Crosshead for Bucket Shafts.* James E. Harding. (16) Apr. 3.
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 Hanging-Wall Support on the Far East Rand.* L. W. Macer. (From *Journal of the Chemical, Metallurgical and Min. Soc. of South Africa.*) (103) Apr. 10.
 The Friction of Ventilating Currents.* Walter S. Weeks. (103) Apr. 24.
 Railway Spreader Car Handles Heavy Materials. (Ore Mining). (13) Apr. 29.
 Price-Pancoast Breaker Relies on Gravity to Do Much of the Work.* Dever C. Ashmead. (45) Apr. 29.
 Die Erzeugung und Verwendung flüssiger Luft zu Sprengzwecken.* H. Diedrichs. (50) Jan. 8.

Miscellaneous.

- Oxide Purification.* G. W. Anderson. (66) Mar. 23.
 The Fixation of Atmospheric Nitrogen by the Silent Electric Discharge Process. C. Francis Harding and K. B. McEachron. (42) Serial beginning Apr.
 Ethylene and Propylene Chlorhydrius and Glycols from Oil Gas.* Benjamin T. Brooks. (105) Apr. 7.
 Duties of a Young Engineer on the Construction of a Hydro-Electric Plant.* H. S. Slocum. (From J. E. Aldred Lecture read before Johns Hopkins Univ.) (96) Apr. 15.
 The Lake Asphalt Industry.* J. Strother Miller, Jr. (Paper read before New Jersey Chemical Soc.) (105) Apr. 21.
 Technical Application of Hydrogen in Hydrogenation or Hardening of Oils.* Harry L. Barnitz. (105) Apr. 21.
 Le Cinématographe en Couleurs Naturelles par le Procédé Trichrome Gaumont.* (33) Mar. 6.
 Die Kohlenpreise in England unter dem Kriege.* A. Argelander. (50) Nov. 8, 1917.
 Höchstpreise für Eisen und Stahl. Karl Dittmar. (50) Dec. 6, 1917.
 Deutsche Industrienormen.* (48) Aug. 31, 1918.
 Die gebundene Planwirtschaft und die Eisenindustrie. (50) July 17, 1919.
 Pläne zum Umbau der industriellen Interessenvertretungen unter besonderer Berücksichtigung der Eisenindustrie. Ernst Heinson. (50) Aug. 7, 1919.
 Verkehrsfragen nach Friedensschluss. Hermann Littrow. (53) Serial beginning Oct. 3, 1919.
 Ueber den Wiederaufbau Nordfrankreichs. Kruchen. (40) Oct. 11, 1919.
 Zur Reform der Technischen Hochschule. A. Nägel. (48) Nov. 29, 1919.
 Beitrag zur Berechnung des Umfanges der Ellipse.* Theodor Schmidt. (53) Serial beginning Dec. 19, 1919.
 Wiedergutmachungspflicht Deutschlands nach dem Versailler Friedensvertrage. Fröchtling. (50) Jan. 1.
 Ueber Siedlungswesen, Bodenrecht und Grundwertsteuer. Hans Bartack. (53) Serial beginning Jan. 9.
 Durch welche Mittel muss die deutsche Industrie der Veränderung ihrer Produktionsbedingungen Rechnung tragen. August Müller. (48) Jan. 3.

Miscellaneous—(Continued).

- Die neue Steuergesetzgebung. W. Beuck. (50) Jan. 22.
 Die Bewertung von städtischen Wohngebäuden und Baugrunden als Grundlage der Steuerbemessung. Walter Schuloff. (53) Apr. 2.

Municipal.

- The Importance of Zoning a Municipality. Louis Bartlett. (60) Apr.
 Voraussetzungen und Aufgaben der grossen Pariser Stadterweiterungskonkurrenz. Nils Hammarstrand. (53) Mar. 5.

Railroads.

- Note on the Use of Reinforced Concrete in England for Railway Work, Other than Bridges and Buildings.* L. W. Weissenbruch. (88) Oct.-Dec., 1919.
 The Automatic Train Control Problem. H. S. Balliet. (65) Mar. 19.
 Passenger Locomotives for Chicago, Milwaukee & St. Paul Railway.* A. F. Batchelder and S. T. Dodd. (42) Apr.
 The Baldwin-Westinghouse, Chicago, Milwaukee & St. Paul Electric Locomotive.* N. W. Storer. (42) Apr.
 Unusual Landslide on English Railway.* (87) Apr.
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 Power Signals on the Victorian Railways.* (21) Serial beginning Apr.
 The B. E. F. Base Locomotive Shops.* (21) Apr.
 The Casting and Machining of Locomotive Cylinders.* (21) Apr.
 The Electric Railroad Over the Rockies.* B. S. Beach. (46) Apr. 3.
 Increasing Locomotive Operating Efficiency.* R. S. Mounce. (15) Apr. 16.
 Unique Design of Reinforced Concrete Wing Walls.* (15) Apr. 16.
 Solid Chrome Nickel Steel Special Trackwork. (17) Apr. 17.
 Railway Car Materials—Steel.* Norman Litchfield. (17) Serial beginning Apr. 17.
 Methods, Costs and Results of Survey for Logging Railroads. (86) Apr. 21.
 An Interesting Type of Flat Slab Construction.* (Viaduct.) (15) Apr. 23.
 Hochofenschlacke als Eisenbahnschotter.* M. Gary. (50) Sept. 13, 1917.
 Beitrag zur Frage über das Gefüge riffeliger Schienen.* Paul Goerens. (50) Nov. 1, 1917.
 Die durchgehende Güterzugbremse. Staby. (48) June 15, 1918.
 Die Beziehungen zwischen Rad und Schiene hinsichtlich des Kräftespiels und der Bewegungsverhältnisse.* J. Jahn. (48) Serial beginning Mar. 16, 1918.
 Versuche mit Speisewasservorwärmen und Speisepumpen für Lokomotiven.* Ludw. Schnelder. (48) Serial beginning May 11, 1918.
 Das Prüflaboratorium für Berufseignung bei der Königlich Sächsischen.* A. Schreiber. (48) Serial beginning July 13, 1918.
 1E-Dreizylinder-Heissdampf-Güterzuglokomotive des Kaiserl. Ottomanischen Kriegsministeriums, Konstantinopel.* G. Heise. (48) Nov. 9, 1918.
 Die Reichseisenbahnen. R. Quatz. (50) July 3, 1919.
 Das Verhalten der freien Lenkachsen bei der Bewegung der Eisenbahnwagen in Gleisbogen. Chr. Boedecker. (40) July 30, 1919.
 Studien über die Vorschriften für die Beförderung verdichteter und verflüssigter Gase auf Eisenbahnen.* A. Wogrinz und F. Halla. (53) Serial beginning Oct. 17, 1919.
 Elektrische Zugförderung und Diesellokomotiven. (40) Oct. 22, 1919.
 Ueber die Dampferzeugung im Lokomotivkessel.* Meinke. (48) Nov. 22, 1919.
 Ist die Durchführung der Kolbenstange bei Heissdampflokomotiven nötig? J. Stumpf. (48) Dec. 6, 1919.
 Vorschläge zur Reform des deutschen Verkehrswesens.* Otto Buschbaum. (48) Dec. 6, 1919.
 Versuche mit Motorlokomotiven im Treidelbetrieb; ein Beitrag zu neuen Richtlinien im deutschen Motorlokomotivbau.* Hartwig Orenstein. (48) Dec. 13, 1919.
 Arbeiten deutscher Eisenbau-Werke aus den Kriegsjahren 1914 bis 1918.* H. Bösenberg. (50) Serial beginning Jan. 22.
 Elektrische Zugförderung auf der Strecke Kiruna-Riksgränsen der schwedischen Staatsbahn.* Winkler. (48) Serial beginning Feb. 21.
 Die kritische Geschwindigkeit der Löttschberg Lokomotive, Typ 1E1, analytisch und graphisch berechnet.* Karl E. Müller. (107) Mar. 6.

Railroads, Street.

- Street Railway Permanent Track Construction.* C. C. Sutherland. (96) Apr. 22.
 Le Metropolitain "Alphonse XIII" de Madrid.* J. E. Ribera. (33) Mar. 6.
 Güterbeförderung auf Strassenbahnen als technisch-wirtschaftliche Notwendigkeit im grossstädtischen Verkehrswesen. Wilhelm Neumann. (53) Serial beginning Jan. 16.

Roads and Pavements.

- Method of Providing Drainage and Reconstructing Old Water Bound Macadam.* W. P. Robinson. (From *The Surveyor*.) (86) Mar. 31.

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 New Developments in Construction of Bituminous Concrete Pavements. Theodore S. Oxholm. (Paper read before Am. Road Builders' Assoc.) (60) Apr.
 Recent Experience in the Development of Brick Pavement Construction in the City of Chicago.* H. J. Flxmer. (60) Apr.
 Construction and Maintenance of the Ashokan Highways.* George G. Honness. (13) Apr. 1.
 Concrete Road Construction Methods on Contract No. 8 of the DuPont Highway, Delaware.* George A. Sherron. (86) Apr. 7.
 Methods of Maintaining Water Bound Macadam at Hartford, Conn. Leon F. Peck. (Paper read before Yale Univ.) (86) Apr. 7.
 Sand Aggregate for Concrete Base and Pavement. P. L. Brockway. (Abstract of paper read before Am. Soc. of Mun. Impvts.) (86) Apr. 7.
 Effect of Car Tracks Upon Traffic Capacity of Roadways. Geo. W. Tillson. (Abstract of paper read before National Traffic Assoc.) (86) Apr. 7.
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 Wood Block Pavement Fails Through Contraction and Flotation.* W. W. Horner. (13) Apr. 22.
 Determining Bitumen Content in Bituminous Concrete.* Roy M. Green. (13) Apr. 29.

Sanitation.

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 Salt Lake's Five-Year Sewerage Program is Completed.* (13) Apr. 1.
 Studies of Maintenance Work on Drainage Ditches.* H. M. Lynde. (13) Apr. 8.
 Dilution Requirements of Sewage and Sewage Effluents.* C. B. Hoover and C. D. McGuire. (13) Apr. 15.
 Activated-Sludge Experiments at Worcester, Massachusetts.* Ray S. Lamphear. (13) Apr. 22.
 Utilizing Imhof Sludge on Land at Plainfield Sewage Works. John R. Downs. (13) Apr. 29.
 Das Gasschiff der preussischen Medizinalverwaltung zum Ausgasen pestverdächtiger Schiffe; Eine Verbindung des CO- und eines neuen SO₂-Verfahrens.* A. Rudolf und Fritz Kirstein. (48) Mar. 30, 1918.
 Grundsätze und neue Wege für den Bau von Kunstarmen mit kraftschlüssig bewegbaren Gelenken und willkürlich steuerbarer Greifhand.* Heinrich Troendle. (48) Serial beginning Apr. 18, 1918.
 Die zukünftige Kohlenwirtschaft im Hause.* Karl Brabbée. (48) Serial beginning Feb. 16, 1918.
 Gewinnung von volkswirtschaftlich bedeutungsvollen Werten aus Tierleichen, Schlachthausabfällen usw.* H. Kleemann. (48) Oct. 25, 1919.
 Liegehallen und Freilufthäuser.* Arch. Mox Setz. (53) Serial beginning Jan. 23.
 Die Gasgewinnung aus Klärschlamm. Trautmann. (48) Serial beginning Jan. 31.

Structural.

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 Brush Coat Should Follow Trimming of Treated Timber.* George M. Hunt. (13) Apr. 15.
 Methods and Costs of Constructing Tunnel for Heating and Power Lines.* W. C. Huntington and W. E. Brockway. (From Univ. of Colorado *Journal of Engineering*). (86) Apr. 21.
 Proportioning Concrete from Study of the Aggregate.* G. M. Williams. (13) Apr. 22.
 L'Execution des Ouvrages in Béton Armé. M. J. Petitbois. (30) Dec., 1919.
 Les Betons Légers et les Records de la Grande Construction.* Charles Rabut. (33) Mar. 6.
 Versuche mit Hochofenschlacke.* (50) Serial beginning July 5, 1917.
 Ueber den Einfluss des Warmwalzens auf die mechanischen Eigenschaften und das Gefüge des Kohlenstoffarmen Flusseisens.* F. Wüst und W. C. Huntington. (50) Serial beginning Sept. 13, 1917.
 Die Stützung von Dampfkesseln und von Wasserleitungen.* E. Höhn. (48) Mar. 23, 1918.

Structural—(Continued).

- Die Getreideumschlaganlage am Hafen III zu Bremen.* Ernst Overbeck. (48) Serial beginning May 25, 1918.
- Beitrag zu der Berechnung quergestützter Druckstabe.* H. Kayser. (48) Serial beginning June 22, 1918.
- Zusammenhang von Kerbschlagarbeit, Zerreißfestigkeit, Dehnung und Brinell-Härte.* G. Berndt. (48) July 6, 1918.
- Neuere Beobachtungen an Bördelblechen.* Richard Baumann. (48) Sept. 21, 1918.
- Vorschläge zur künftigen Gestaltung der I-Eisen.* Richard Sonntag. (48) Dec. 7, 1918.
- Versuche über Wasserundurchlässigkeit von Putzmörtel mit verschiedenen Dichtungsmitteln.* Lange. (49) Pt. 10, 1919.
- Die Durchbiegung der Rahmenträger.* E. Elwitz. (49) Pt. 10, 1919.
- Ueber die Beanspruchung von I-Trägern durch Drehmomente.* A. Senft. (49) Pt. 10, 1919.
- Beitrag zur Berechnung kreisförmig gekrümmter Träger auf drei und mehr Stützen.* Kaufmann. (49) Pt. 10, 1919.
- Rissbildung im Eisenbetonbau und ihre Beschränkung. R. Saliger. (53) Serial beginning Oct. 10, 1919.
- Beitrag zur Bestimmung der O-Linie für ringförmige Querschnitte.* Raubal. (53) Oct. 17, 1919.
- Berechnung achsial- und gleichförmig querbelteter Träger.* Julius Ratzersdorfer. (53) Serial beginning Oct. 24, 1919.
- Das Verhalten von bewehrtem Beton in Seewasser. (40) Nov. 1, 1919.
- Ueber die zulässige Pressung zwischen Auflagerplatte und Mauerwerk.* Hans Schäfer. (40) Nov. 19, 1919.
- Ueber Druckstäbe.* Müllenhoff. (48) Nov. 29, 1919.
- Untersuchung eines gebrochenen nahtlos gezogenen Rohres.* E. H. Schulz and R. Fiedler. (50) Jan. 1.
- Einiges aus der Werkstätte des Edelstahlwerkers. Erdmann Kothny. (50) Jan. 8.
- Dimensionierung dickwandiger Gefäße. Leop. Klein. (53) Jan. 30.
- Ueber den Zerfall von Hochofenschlacken.* K. Endell. (50) Serial beginning Feb. 12.
- Beanspruchung des Materials geschweisster zylindrischer Druckgefäße für Gase und Flüssigkeiten mit nach aussen gewölbten Böden durch inneren Druck.* C. Diegel. (48) Feb. 14.
- Ueber die Entgassung des Kesselspeisewassers.* Ludwig Jung. (48) Feb. 21.
- Einiges über den "Winddruck".* Leo Kirste. (53) Mar. 5.
- Hölzerner Dachbinder ohne horizontale Verankerung.* N. Raubal. (53) Mar. 5.
- Günstigste Auflagerung eines einseitig eingespannten Trägers an seinem freien Ende.* Leop. Schröder. (53) Apr. 2.

Topographical.

- Topographic Survey of the City of Flint, Michigan.* C. S. Elicker. (13) Apr. 8.
- Altitude Observation of the Sun for Meridian.* John D. Adams. (For Surveying.) (13) Apr. 29.
- Stereophotogrammetrie.* Franz Manek. (53) Mar. 12.

Water Supply.

- New Filtration Plant of Madras City Waterworks.* James Wilby Mackley. (From *Water and Water Engineering*.) (86) Mar. 31.
- Subsoil Water in Relation to Tube Wells for Irrigation.* T. A. Miller-Brownlie. (86) Mar. 31.
- Flow in Uniform Channels When the Water-Surface is Not Parallel to the Invert.* Alex. H. Jameson. (From *Water and Water Engineering*.) (86) Mar. 31.
- Plan of Chicago's Improved Water System—1920-1955.* P. S. Combs. (117) Apr.
- Experiences with Air Lift Pumps.* W. G. Kirchoffer. (60) Apr.
- Design and Operation of Movable Crest Dams.* Wm. G. Fargo. (60) Apr.
- Water Power Development for Small Plants.* Chas H. Tallant. (111) Apr. 1.
- Reconstruction of the King Hill Siphon and Flumes.* (13) Apr. 1.
- The Sterilization of Water by Means of Ultra-Violet Rays.* Walter L. Decker. (Paper read before Cleveland Eng. Soc.) (105) Apr. 7.
- Waterworks Data for Small Towns and Villages.* D. D. Ewing. (86) Apr. 14.
- Siphon Spillway of Alpine Dam of Marin Water District.* G. F. Stickney. (86) Apr. 14.
- Duties of a Young Engineer on the Construction of a Hydro-Electric Plant.* H. S. Slocum. (From J. E. Aldred lecture read before Johns Hopkins Univ.) (96) Apr. 15.
- Spillways in Nova Scotia Proven Inadequate.* K. G. Chisholm. (96) Apr. 15.
- Use of Heavy Tractors for Hauling Elevating Graders and Wagon Trains from Steam Shovel.* (Salmon Lake Dam.) L. U. Branch. (From *Reclamation Record*.) (86) Apr. 21.
- Additional Water Supply for the City of Chicago, 1920-55. (13) Apr. 29.
- St. Louis Tunnels Unwatered by Air Lift.* Edward E. Wall. (13) Apr. 29.

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- Freighting with Motor Trucks on Kern River Project No. 3. (Hydro-Electric Development.) (13) Apr. 29.
- Doppelzwillingsturbinen.* Gg. v. Troeltsch. (48) Apr. 20, 1918.
- Statische Berechnung der Trommelringaussteifungen an Hochbehältern auf Einzelstützen.* J. Schmidt. (48) Apr. 27, 1918.
- Die Geschwindigkeitsverteilung bei gleichmässiger Bewegung offener Wasserläufe. Fr. Engesser. (48) Apr. 27, 1918.
- Mitteilungen aus dem Dresdener Flussbau Laboratorium.* Hubert Engels. (48) Serial beginning June 15, 1918.
- Die Grösse von Vorratsbecken für Wasseraufspeicherungen. Mattern. (48) July 6, 1918.
- Veranschlagen von Niederdruckwasserkraften.* Camerer. (48) Serial beginning July 27, 1918.
- Eine neue Wasserturbine.* Dónát Bánki. (48) Aug. 3, 1918.
- Wandstärken von Rohren mit Innendruck.* Maximilian Walski. (48) Aug. 17, 1918.
- Zur Bauweise der Staudämme.* Mattern. (48) Nov. 2, 1918.
- Versuche an Becherturbinen.* Ernst Reichel. (48) Serial beginning Nov. 23, 1918.
- Neuere Verfahren der Trink- und Gebrauchswasser-Aufbereitung. P. Ziegler. (49) Pt. 10, 1919.
- Ueber die Herstellung nahtloser Rohre unter besonderer Berücksichtigung des Mannesmann-Schrägwalz-Verfahrens.* Karl Gruber. (50) Serial beginning Sept. 4, 1919.
- Eine neue Geschwindigkeitsformel für Röhren. J. Kozeny. (53) Sept. 26, 1919.
- Berechnung des Staues infolge von Querschnittverengungen.* H. Krey. (40) Sept. 27, 1919.
- Berechnung der Normalspannungen in den Aussteifungsringen von Hochbehältern auf Einzelstützen.* Constantin Weber. (48) Oct. 4, 1919.
- Bremsergebnisse der ersten in Deutschösterreich eingebauten Kaplan-Turbine.* Berth. Blümel. (53) Nov. 21, 1919.
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- Ueber Spaniens elektrische Sammelachse.* Albert Schmid. (107) Feb. 14.
- Der Bau der Wasserkraftanlage für die Elektrizitätsversorgung von Oberkrain.* Otto Felix Schosberger. (53) Serial beginning Feb. 20.
- Einfache Theorie der Regulervorgänge indirekt wirkender Regulatoren.* H. Joos. (107) Serial beginning Feb. 21.
- Ueber die Entgasung des Kesselspeisewassers.* Ludwig Jung. (48) Feb. 21.
- Elektrische Zuführung auf der Strecke Kiruna-Riksgränsen der schwedischen Staatsbahn.* Winkler. (48) Serial beginning Feb. 21.
- Die Verluste durch Undichtheit in Niederdruckleitungen.* M. Berlowitz and E. Jasse. (48) Feb. 28.

Waterways.

- Experiences in Subaqueous Concrete Work.* Henry R. Lordly. (36) Mar.
- Flood Prevention Projects to Protect Winnipeg.* Douglas L. McLean. (96) Apr. 1.
- Design and Operation of Modern Car-Dump Coal Pier.* (13) Apr. 15.
- Pile and Concrete Piers for Missouri River Bridge.* (13) Apr. 22.
- Progress on New Orleans, Inner Harbor-Navigation Canal.* Marshall G. Findley. (13) Apr. 22.
- Design and Construction of Notus Canal Inverted Siphon.* (13) Apr. 29.
- Progress and Costs on Erie, Pa., Flood Control Project.* Farley Gannett. (13) Apr. 29.
- La Transformation du Canal du Rhone au Rhin et sa Mise au Gabarit de 300 Tonnes.* Auguste Pawlowski. (33) Feb. 28.
- Die Getreideumschlaganlage am Hafen III zu Bremen.* Ernst Overbeck. (48) Serial beginning May 25, 1918.
- Die Tauchschleuse, eine neue Schleuse ohne Wasserverbrauch.* Böhmeler. (48) Serial beginning Oct. 19, 1918.
- Abänderung des Einganges zum Hafen von Delfzyl an der Ems.* A. v. Horn. (40) July 30, 1919.
- Die Erzkipperanlage im Nordhafen von Hannover und Entwicklungsmöglichkeiten der neuen Bauart für Umschlaganlagen.* F. Boersch. (50) Sept. 4, 1919.
- Der Eisbrechdienst auf der Elbe im Februar, 1919.* Rogge. (40) Sept. 27, 1919.
- Der Panamakanal im Betrieb. A. v. Horn. (40) Dec. 3, 1919.
- Die Abmessungen der deutschen Hauptkanäle.* Th. Hoech. (48) Dec. 13, 1919.
- Versuche mit Motorlokomotiven im Treidelbetrieb.* Hartwig Orenstein. (48) Dec. 13, 1919.
- Vorschlag zur Lösung der Karlsbader Hochwasser-, Strassenbahn- und Stadtreinigungsfrage durch Einbau von Druckrohren in der Tepl.* Raimund Janesch. (53) Serial beginning Dec. 19, 1919.
- Die österreichische Donauschiffahrt nach dem Kriege. Ludwig Wertheimer. (53) Serial beginning Jan. 30.

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